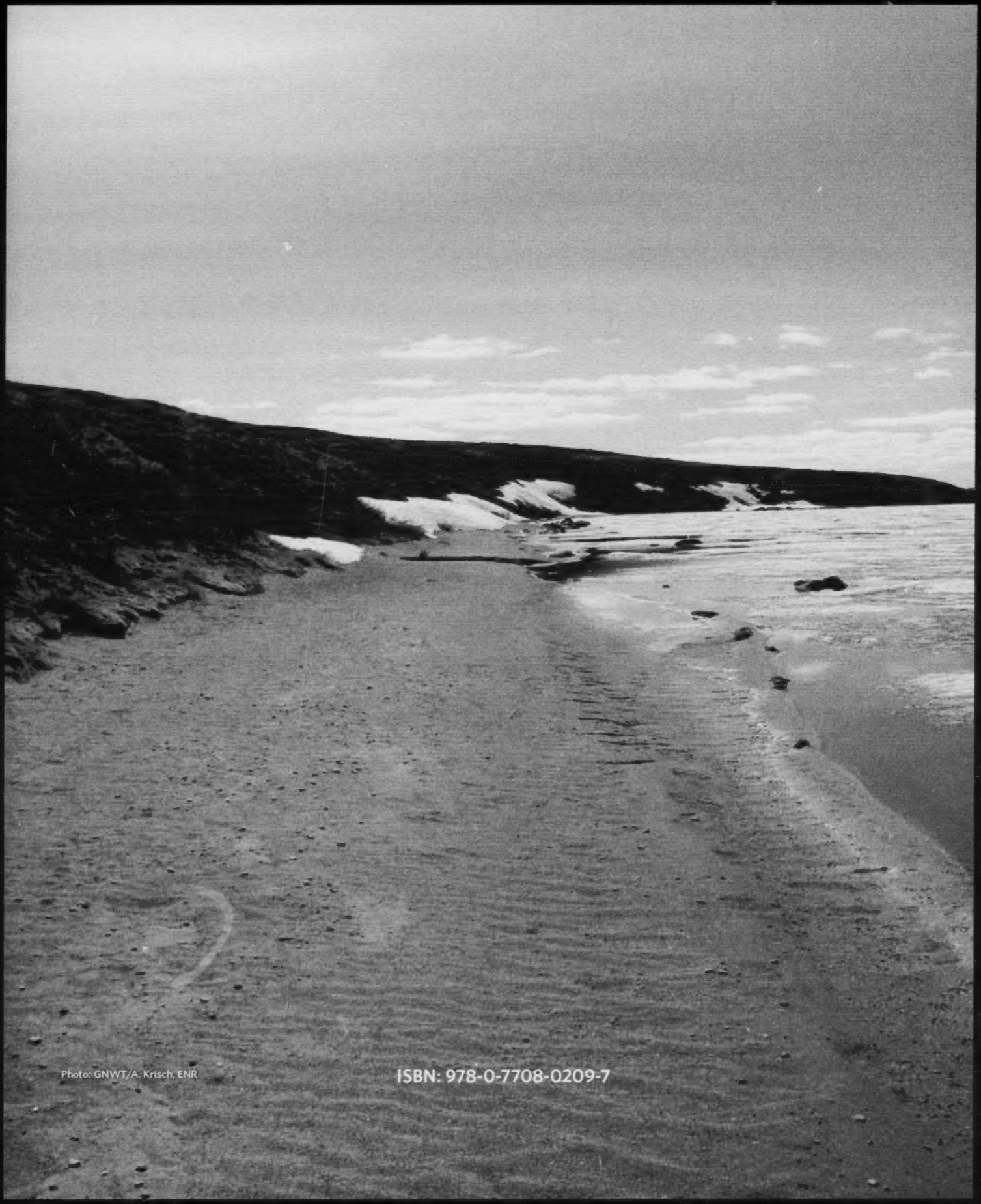
2012 Annual Report of

Wildlife Research In The NWT

Photo: GNWT/R. Decker, ENR

Northwest Territories Environment and Natural Resources



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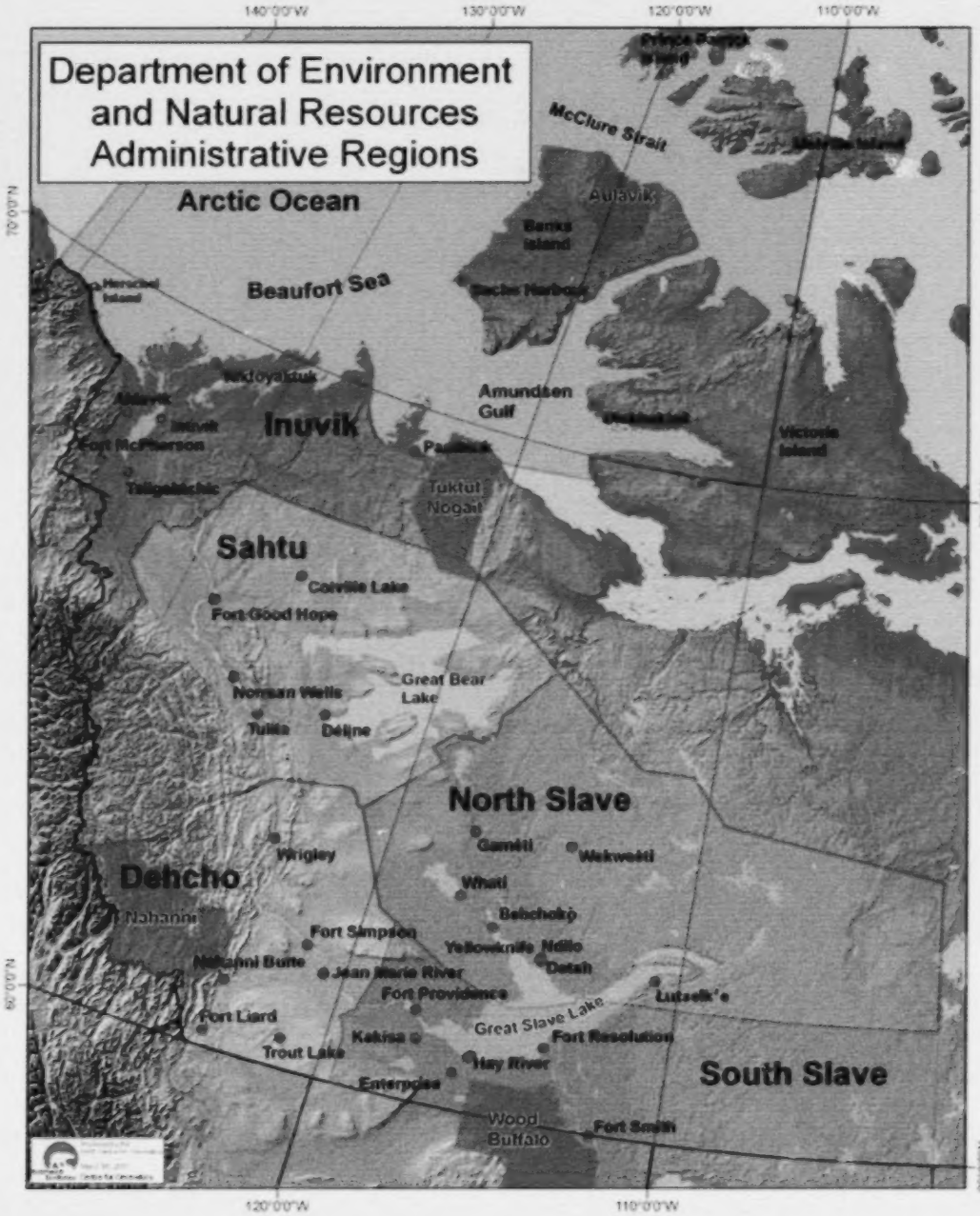
Department of Environment and Natural Resources Administrative Regions
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70°0'0"N
60°0'0"N
Arctic Ocean
Beaufort Sea
McClure Strait
Banks Island
Aulavik
Amundsen Gulf
Victoria Island
Inuvik
Sahtu
North Slave
South Slave
Dehcho
Fort McPherson
Tuktut Nogait
Colville Lake
Fort Good Hope
Norman Wells
Great Bear Lake
Tulita
Deline
Wrigley
Gamèti
Wekweètì
Whatì
Behchokǫ̀
Fort Simpson
Yellowknife
Ndilo
Dettah
Nahanni Butte
Jean Marie River
Fort Providence
Lutselk'e
Fort Liard
Kakisa
Great Slave Lake
Fort Resolution
Trout Lake
Hay River
Enterprise
Wood Buffalo
Fort Smith

NORTHWEST
TERRITORIES

Photo: GNWT/A. Krisch, ENR

2012 Annual Report of Wildlife Research in the NWT

INTRODUCTION

Under section 24 of the *Wildlife Act* RSNWT 1988, a valid Wildlife Research Permit is required to study wildlife or wildlife habitat in the Northwest Territories (NWT). It is an offence to conduct a survey or census of wildlife or wildlife behaviour, administer drugs, collect or purchase specimens, or carry out any scientific research relating to wildlife without a permit.

The Government of the Northwest Territories (GNWT) Department of Environment and Natural Resources (ENR) is responsible for issuing Wildlife Research Permits. Each year, researchers carry out studies on all types of wildlife and wildlife habitat, throughout the NWT. As a requirement of an NWT Wildlife Research Permit, researchers must submit a summary report of their activities and findings to ENR.

Studies receiving funds from the Western NWT Biophysical Study also require a Wildlife Research Permit and reporting because they relate to wildlife and wildlife habitat research. The Western NWT Biophysical Study was established to help ensure baseline data necessary to assess, mitigate and monitor the environmental impacts of proposed developments in the Western NWT is available to industry, regulators, communities and government. The program focuses on areas within the mandate of the ENR: wildlife, wildlife habitat, forests and air quality.

The Western NWT Biophysical Study provided $390,000 towards projects in 2012/2013. In addition to research projects, workshops are held in each of the Mackenzie Valley regions to review progress of the Study and to ensure priority information needs are being addressed. Partnerships with federal agencies, wildlife management boards, universities, non-government organizations and industry have been developed on a project-by-project basis. Most projects involve multiple partners.

This publication provides summary reports for all wildlife research and biophysical studies carried out during 2012. Contact information for the main investigator leading each project has been included if you wish to obtain more information on a specific project. For more information on wildlife research in the NWT, please go to www.enr.gov.nt.ca or contact your local Environment and Natural Resources office.

DISCLAIMER

The contents of each summary in this report are the sole responsibility of the team leads for each project and do not reflect any official policy of ENR or the GNWT.

Bat Surveys and Investigation of Northern Adaptations of Little Brown Bats in the South Slave Region

April 2011 to March 2013

MAIN INVESTIGATIORS:

Dr. Robert Barclay, Jesika Reimer, Laura Kaupas, Department of Biological Sciences, University of Calgary

WILDLIFE RESEARCH PERMIT NUMBER:

WL500046

LOCATION:

South Slave region including Fort Smith and Kakisa, NWT.

PARTNERS:

- Environment and Natural Resources, Fort Smith, NWT
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- Parks Canada, Wood Buffalo National Park, NWT
  Contact: Sharon Irwin, Resource Management Officer

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RATIONALE:

Little is known about bats in the NWT. The presence of winter hibernacula and summer maternity colonies in Wood Buffalo National Park (WBNP) and the South Slave region provide a great opportunity to investigate how these hibernating, nocturnal mammals persist at northern latitudes given the short summers and short summer nights. We investigated how little brown bat populations can persist with these climatic constraints while adhering to a hibernating and nocturnal lifestyle.

OBJECTIVES:

- To gather baseline information for northern bat species' presence and little brown bat population structure and health, to assist in monitoring for white nose syndrome in WBNP and the NWT;
- To describe the annual cycle of little brown bats in the South Slave region, including timing of reproduction and hibernation;
- To investigate foraging behaviours of little brown bats in response to short summer nights at northern latitudes; and
- To compare the diet of two sympatric *Myotis* species at northern latitudes.

METHODS:

We collected data via mist-netting, echolocation recordings and radio tracking from May to September 2011 and 2012. We handled 1,225 bats captured in mist nets during 2011 and 2012. We identified individuals to species, sex, age and reproductive condition, weighed them with a portable balance, measured such morphological features as forearm and ear length, banded them on the forearm with metal, lipped bands for future identification, and released them at their point of capture. From early May until late August 2011 we placed AnaBat echolocation detectors in various habitats

to assess species presence and feeding activity. We placed radio transmitters on 20 adult female little brown bats to track individuals to their roosts during the day and to determine nightly foraging patterns.

RESULTS AND MAIN CONCLUSIONS:

Species presence:

We acoustically confirmed (with echolocation recordings) the presence of *Lasiurus cinereus* (hoary bat) and *Lasionycteris noctivagans* (silver-haired bat) in the South Slave region, and physically confirmed (with captures) the presence of *Myotis lucifugus* (little brown bat), *Myotis septentrionalis* (northern myotis) and *Eptesicus fuscus* (big brown bat). We observed reproducing female *M. lucifugus* in old buildings and cabins, and reproducing female *M. septentrionalis* in decaying deciduous tree stands. We captured juvenile *E. fuscus* entering karst caves, suggesting that *E. fuscus* is also reproducing in the South Slave region. All three species were observed exiting/entering the hibernacula in WBNP and the South Slave region during spring and autumn. White-nose syndrome was not observed in WBNP or the South Slave region.

Annual Cycle:

We observed *M. lucifugus* using hibernacula during a similar annual time period as bats further south (late April to early October). Due to the relatively cooler spring and autumn temperatures in the South Slave region, this meant that bats were active at cooler temperatures (min temp: -7°C) compared to more southerly bats (typical min temp: 10°C). During these cooler temperatures, *M. lucifugus* ate spiders more frequently, a food source that is largely absent from their diets during warmer nights. Female *M. lucifugus* gave birth later (late June to mid-July) than more southerly colonies (late May to mid-June). While this delay reduces the time available for reproductive females and juveniles to accumulate fat stores for hibernation, individuals captured immediately prior to hibernation were at masses comparable to more southerly bats suggesting that this reduced time period is sufficient, possibly due to high insect abundance in the area.

Foraging behaviour:

Foraging activity of *M. lucifugus* decreased with cooler temperatures yet was unaffected by rain, and increased with cloud cover. Bats foraged consistently during the short summer nights, exiting their roost after civil twilight and returning at sunrise. This behaviour deviates from more southerly bats that forage for a minimum of two distinct bouts per night with a period of rest in between. The omission of a nightly rest period in the South Slave region may exist to compensate for the reduced night duration. In addition, echolocation recordings at foraging sites indicate a higher rate of insect captures indicative of higher insect abundance. Therefore, bats in the South Slave region may be able to compensate for the short summer nights and delayed parturition timing with increased foraging rates due to high prey abundance in the area.

Diet comparisons of two sympatric species:

Diets of *M. lucifugus* and *M. septentrionalis* were significantly different, with aerial insects being predominant in the diet of *M. lucifugus*, and prey that is often gleaned being predominant in the diet of *M. septentrionalis*. Spiders were present in the diet of *M. septentrionalis* throughout the summer. However, spiders were only present in the diet of *M. lucifugus* early and late in the active season when there are low nightly temperatures. There was no evidence of spider in the diet of *M. lucifugus* during late June or July. The overlap in the diet suggests that there is flexibility in the foraging

Photo: J. Reimer

Radio tracking little brown bats to their day roosts.

strategy of *M. lucifugus* and *M. septentrionalis*, while differences in their morphology (wing loading and aspect ratio) suggest that they forage in separate habitats when permissible by prey abundance.

LONG-TERM PLANS AND RECOMMENDATIONS:

Two *Myotis lucifugus* maternity colonies have been established as long-term study sites with the fitting of 618 individuals with unique identification bands during 2011 and 2012. Recapturing of these individuals will allow us to start assessing population size and survival rates of *M. lucifugus* in these areas. A new study is currently being planned for 2014 to investigate *Myotis septentrionalis* maternity colonies in the South Slave and will continue monitoring the *M. lucifugus* colonies. Continued monitoring of hibernacula and maternity colonies will allow us to identify the presence of white-nose syndrome when it moves into the South Slave region.

COMMUNITY INVOLVEMENT:

Numerous presentations and interactive events were held during the 2011 and 2012 field seasons to encourage public awareness and involvement in our research project.

The following presentations were given during the 2011 and 2012 field seasons:

- Joseph Burr Tyrell Elementary, Grade 2 French immersion, Fort Smith, NWT, May 2011.
- Parks Canada, general public, Fort Smith, NWT, June 2011.
- St Patrick High School, science camp, Yellowknife NWT, June 2011.
- Aurora College, ENRT spring field school, Tsu Lake, NWT, August 2011.
- Kakisa Lake Elementary, Kakisa, NWT, September 2011.
- Community gathering, Kakisa, NWT, September 2011.
- Parks Canada, general public, Fort Smith, NWT, September 2011.
- South Slave Regional Wildlife Workshop, Fort Smith, NWT, November 2011.
- GNWT, local biologists and general public, Yellowknife, NWT, July 2012.
- Parks Canada, general public, Fort Smith, NWT, August 2012.
- Dehcho Regional Wildlife Workshop, Fort Simpson, NWT, October 2012.

Numerous netting events were held around Fort Smith, Salt River and Kakisa during the 2011 and 2012 field seasons. Audiences included local residents, wildlife biologists, Parks Canada staff and visiting tourists. Locations included:

Pelican Rapids trail (Fort Smith), Little Buffalo Falls, Thebacha campground (Salt River), Kakisa, and Lady Evelyn campground.

In addition, we assisted the Departments of Industry and Tourism (ITI), and Environment and Natural Resources (ENR) in Yellowknife, Hay River and Fort Smith, to develop interpretive panels, artificial bat houses (Lady Evelyn Falls campground) and public educational material (brochure and poster) to increase awareness and understanding of bats in the NWT.

Northern myotis with radio transmitter attached to its back.

Photo: J. Reimer

Aerial Survey for Polar Bears in the Far Offshore Beaufort Sea

March 21 to 30, 2012

MAIN INVESTIGATOR:

Evan Richardson, Polar Bear Research Biologist, Environment Canada

WILDLIFE RESEARCH PERMIT NUMBER:

WL005408

LOCATION:

Aerial line-transect surveys for polar bears were conducted in the Northern Beaufort Sea in areas up to 300 nautical miles offshore. Work was based out of the communities of Sachs Harbour and Inuvik, NWT.

PARTNERS:

- Joint Secretariat Inuvialuit Settlement Region
- Aboriginal Affairs and Northern Development Canada (AANDC)
- Environment Canada
- Government of the Northwest Territories
- Sachs Harbour Hunters and Trappers Committee

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RATIONALE:

The Beaufort Regional Environmental Assessment (BREA) is a multi-stakeholder partnership led by Aboriginal Affairs and Northern Development Canada. BREA is designed to simplify project-level environmental assessment and regulatory decision-making for oil and gas activities, while strengthening the relationship between environmental assessment and integrated planning and management in the region. BREA also engages communities and advances their priorities for oil and gas preparedness. The potential presence of polar bears in the deep waters of the offshore region of the Beaufort Sea has been a longstanding interest and concern of Inuvialuit communities. This concern has been elevated with the current interest in oil and gas development in the area. Estimates of polar bear density in the offshore region of the Beaufort Sea will enable regulators to better understand potential effects of offshore oil and gas development activities on these marine mammals.

OBJECTIVES:

- To assess the distribution and abundance of polar bears in areas of the offshore Beaufort Sea.

METHODS:

A system of 24 randomly placed transects was defined on the study area. Due to logistical constraints in Sachs Harbour, half of the transects ran east-west and were flown out of Sachs Harbour, while the other half ran north-south and were flown out of Inuvik, NWT. This system of transects was surveyed on eight of the nine days between March 21 and 29, 2012 (no flights occurred on March 25). Individual flights were 4.5-5 hours in duration. Two flights were completed on several days because it was possible to refuel and return to the area. Surveys were flown at an approximate air speed of 120 kts/hr and an average altitude of 233 m (784 ft.).

Aerial flights were conducted in a Gulfstream Turbo Commander (AC-690) aircraft containing four observers and two pilots. Two observers were placed in the front seat (behind pilots, one per side). The remaining two observers were placed in the rear seats (one per side). One observer on each side functioned as the data recorder, while the other observer was responsible for the global positioning system (GPS). Observers rotated positions in the aircraft daily to ensure differences in observation abilities were distributed across all positions. Observers on the same side of the aircraft operated as a double-observer system. When a polar bear was sighted, the event was not immediately announced. Instead, the observer making the sighting waited an appropriate length of time (~5s) to ensure that the other observer on the same side of the aircraft had adequate time to make the detection. Immediately after detection, the original observer measured the sighting angle from bear to horizon using an inclinometer. Once the detection was announced, the second observer also measured the sighting angle using an inclinometer. Position of the aircraft, side of aircraft, inclinometer measurements, and observer(s) making the detection were recorded.

RESULTS AND MAIN CONCLUSIONS:

A total of four polar bears (two adult females and two yearlings) were sighted in two groups on the study area. Outside the study area, an additional five bears (two adult females, one yearling, and two cubs of the year) were sighted. Data from this study were not sufficient to estimate a sightability function using standard line transect methods, nor confidence intervals. Instead, the sightability estimated by Evans et al. (2003), after adjustment for differences in flight altitude, was used to inflate the number of observed bears into an abundance estimate. The effective strip width used in this study was 0.845 km. The number of bears on the study area during the latter weeks of March 2012 was estimated to be approximately 124, which equates to a density of 0.061 bears/100 km^2. This density is substantially lower than that reported by Evans et al. (2003) in near shore areas of the eastern Chuckchi and western Beaufort Sea (0.87 bears/100 km^2). An internal report has been submitted to AANDC as well as to the Inuvialuit Joint Secretariat.

LONG-TERM PLANS AND RECOMMENDATIONS:

Many polar bear tracks were sighted during the surveys. In future, it may be advisable to implement a sampling mechanism which allows the aircraft to follow tracks until a bear is sighted or until a maximum distance from the transect line is reached. Many kilometers of transect were flown without polar bear observations. This fact made observing monotonous, which could have led to observer inattention. Future surveys should consider additional training for observers, or frequent crew changes. At this point in time there are no plans to repeat this study.

COMMUNITY INVOLVEMENT:

Community members from Sachs Harbour, NWT were involved as observers on all survey flights.

Southern Beaufort Sea Polar Bear Project

March 2012 to June 2012

MAIN INVESTIGATOR:

Ramona Maraj, Carnivore Biologist, Department of Environment, Government of Yukon

WILDLIFE RESEARCH PERMIT NUMBER:

WL005409

LOCATION:

The study area included the Southern Beaufort Sea polar bear subpopulation range from the Alaska/Yukon border to Tuktoyaktuk, NWT.

PARTNERS (PROJECT PERSONNEL):

- Marsha Branigan, Manager Wildlife Management, Environment and Natural Resources, Inuvik, NWT
- Shelly Marshall, Carnivore Program Technician, Yukon Government
- Dorothy Cooley, Northern Regional Biologist, Yukon Government
- United States Geological Survey - Polar Bear Group

CONTACT:

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RATIONALE:

Concerns over long-term conservation of polar bears (*Ursus maritimus*) are increasing. The United States Fish and Wildlife Service (USFWS) listed polar bear as Threatened under the *Endangered Species Act* in 2008. COSEWIC assessed this species as Special Concern in Canada and polar bears were recently listed under the federal *Species at Risk Act*. These listings and the iconic nature of the species have raised its international profile. Consequently there will be substantial international scrutiny as to whether all jurisdictions with polar bears in Canada work together on monitoring and management programs.

The Southern Beaufort Sea population, adjacent to the Yukon north coast, has been singled out as one of the two polar bear subpopulations of concern for management. Accepted models of climate warming identify the area off the Yukon and Alaskan north coast as undergoing rapid ice and associated polar bear habitat loss. Analyses based on work conducted by the United States Geological Survey (USGS) and Canadian Wildlife Service indicates that this subpopulation is likely to decline.

As a result of these potential climate stressors and other impacts on the Southern Beaufort Sea subpopulation, additional monitoring efforts are needed to assist in wildlife management efforts for this species and to have the best available information for management. The need for more information has been expressed in several forums. Under the recent Inuvialuit-Inupiat recommendations, there was a request for all the technical advisors from both Canada and US to develop a five year plan that includes considerations for non-invasive monitoring of this subpopulation. Additionally, concerns over the future development in oil and gas lease areas and the effects that would have on polar bears, support the need for additional distribution and abundance work in that area.

OBJECTIVES:

- To evaluate and further develop a non-invasive technique as a method that will allow estimation of numbers of bears; and

- To provide additional information about the numbers of bears in the distant offshore and in particular over the Chevron offshore lease to complement the Beaufort Regional Environmental Assessment proposal.

METHODS:

The survey boundary, transect length and survey intensity will be established commensurate with project funding availability. Survey flights would occur during March and include opportunities for participation of agency staff and community members. A sampling design developed by Environment Yukon staff was reviewed and revised with partner organizations prior to implementing the study.

Survey distribution hoped to cover the near shore and the offshore continental shelf regions, including areas covered by the recent Chevron lease interests. Specific methodologies use distance sampling and multiple observer correction factors, similar to methods used in Baffin Bay.

RESULTS AND MAIN CONCLUSIONS:

We conducted an on-ice, pilot aerial survey in the Southern Beaufort Sea subpopulation during late March 2012. The study area extended from the Alaska/Yukon border to Tuktoyaktuk, NWT, and up to ~100 km offshore. A concurrent aerial survey focused in far offshore regions of the Beaufort Sea and was completed from a fixed wing platform.

Transects were spaced at 8 km intervals and oriented in a general north-south direction to simplify logistics and facilitate sampling against presumed density gradients (i.e. transects were arranged roughly perpendicular to high polar bear density features such as the potential floe edge). Surveys were completed from a helicopter (Bell 206 Long Ranger) platform. Data collection followed mark-recapture distance sampling protocols (Laake and Borchers 2004) adapted from overland aerial surveys in the eastern Canadian Arctic (e.g. Stapleton et al. 2012). Participants in the field work included representatives from the Tuktoyaktuk, Aklavik and Inuvik Hunters and Trappers Committees and employees of the governments of Yukon and Northwest Territories and the USGS. Encounter rates, estimated detection functions and strip widths, and sampling effort and projected costs required to achieve target precision levels were among the metrics summarized to evaluate feasibility.

During 20.4 hrs of on-effort survey flights, we sampled along 3,013 km of transects and sighted 21 bears comprising 12 independent groups. Polar bear observations were distributed relatively evenly across the study area; ice was heavily consolidated and no open water was observed. Sightings per unit effort (0.6 groups/survey hr) were comparable to encounter rates obtained with directed searching during mark-recapture field work in the Alaskan Beaufort. Inclement weather precluded additional planned aerial survey flights in Alaska.

Although sightings were limited, data indicated support for distance sampling analyses, with observations declining predictably as distance from the flight path increased. Data were pooled with recent pilot research in the Baffin Bay subpopulation to facilitate estimating distance sampling detection functions and strip widths. Effective half-strip widths – the distance at which as many bears are missed within that distance as there are bears sighted beyond that distance – were estimated at about 650-700 m. Analyses also suggest that obtaining a coefficient of variation of about 20% is technically feasible by increasing total survey effort by six to seven fold (i.e. increasing sampling flights across the Southern Beaufort Sea subpopulation from 3,000 km to roughly 20,000 km). However, several other factors, including bear movements, ice conditions, den emergence dates, study area extent and stratification, required resources, and springtime weather conditions must also be considered with a prospective comprehensive Beaufort Sea aerial survey.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans and recommendations were not submitted.

Examining the Boundaries Between the Northern Beaufort and Viscount Melville Polar Bear Subpopulations

April 13, 2012 to June 1, 2012

MAIN INVESTIGATOR:

Jodie Pongracz, Regional Biologist, Environment and Natural Resources, GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005410

LOCATION:

Research was conducted in two areas of the Northern Beaufort (NB) polar bear subpopulation: 1) north of Norway Island; and 2) from Victoria Island to the mainland (southeast corner of the NB subpopulation area). Research north of Norway Island occurred from a base at Mould Bay in late May 2012. The southeast corner of the subpopulation area was covered during May working from Ulukhaktok, NWT.

PARTNERS:

- Olokhatomiut Hunters and Trappers Committee in Ulukhaktok (OHTC)
- Ekaluktutiak Hunters and Trappers Organization in Cambridge Bay (EHTC)
- Inuvialuit Game Council
- Aboriginal Affairs and Northern Development Canada
- Environment Canada
- Government of the Northwest Territories
- Nunavut Wildlife Management Board
- Polar Continental Shelf
- Wildlife Management Advisory Committee (NWT)
- World Wildlife Fund

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RATIONALE:

To properly manage polar bears it is important to know how many there are, and also where they are. Knowing where bears are is essential to determine the boundaries of subpopulations (i.e. the boundary between the NB and Viscount Melville (VM) subpopulations). It furthermore allows researchers to survey subpopulations using methods/techniques other than traditional mark-recapture (i.e. such as aerial surveys).

Understanding where bears go at differing times of the year is required to ensure that the subpopulation boundaries are accurate. The subpopulation boundary between VM and NB that is currently being used for management purposes was developed from examining polar bear movements from 1989-1991. The sea ice conditions have changed since then and it is likely the movement patterns of polar bears have changed as well.

OBJECTIVES:

- To assess the current boundaries of the VM and NB polar bear subpopulations; and
- To assess polar bear habitat use and movement patterns during changing sea ice conditions in the area of the NB Sea subpopulation north of Norway Island.

METHODS:

Overview:

The proposed collaring of 10-15 adult females (5 north of Norway Island and 5-10 in the Paulatuk and Prince of Wales Strait) in the NB polar bear subpopulation will be conducted during the VM polar bear subpopulation survey.

Collaring and mark-recapture:

Capture procedures will be reviewed and approved by the NWT Wildlife Care Committee. Polar bears will be tracked with a helicopter, immobilized with Telazol

Photo: GN/WTA Pongracz, ENR

Polar bear observed in sea ice habitat in the Northern Beaufort Sea

(using a dart gun) and marked following standard procedures (Stirling et al. 1989). Bears will be captured during spring 2012 in the NB subpopulation region during a systematic search of the specific areas (north of Norway Island; Prince of Wales Strait and east of Paulatuk). Adult female polar bears will be fitted with Argos satellite-linked GPS collars (model: Telonics TWG-4680H-2). Bears that have not been previously captured will be marked with a unique identifying number tattooed (permanent) into the upper and lower inside lips. Captured bears will also receive ear tags that are punched into the fleshy part of the ears. DNA samples of ear plug tissue will be collected and analyzed. If the bear has not been previously captured, a vestigial premolar will be extracted to be used for aging (Calvert and Ramsay 1998). Samples of claw, hair, blood, and fat (a biopsy taken from rump fat) will be collected; and standard body measurements will be taken. A black crayon dot (removable) will be marked on the back of the bear to identify it as being a bear already captured within the season. This mark will be shed with the hair in the spring. Collars will be programmed to collect locations every four hours and fit with a CR2A release mechanism that will be programmed to release the collar after two years. Dropped collars will be retrieved if logistically possible.

RESULTS AND MAIN CONCLUSIONS:

Five collars were deployed on adult female polar bears north of Norway Island. Of these, three females were

with cubs-of-the-year (COYs), one was in a mated pair, and one was alone. Ten collars were deployed on adult female polar bears working from Ulukhaktok. Of these, five females were with COYs, two were with yearlings, one was with a subadult and two were alone.

Data are still being collected from collars deployed in spring 2012. We anticipate collars will provide data for approximately two years, after which analysis will commence.

LONG-TERM PLANS AND RECOMMENDATIONS:

We do not have any current plans to continue collaring in the NB polar bear subpopulation.

COMMUNITY INVOLVEMENT:

Community consultations were conducted in Cambridge Bay and Ulukhaktok in October and November 2010 respectively in relation to the VM polar bear subpopulation survey. These communities were consulted because they are the only two communities that are allocated VM subpopulation tags (the Inuvialuit Game Council is responsible for tag allocation). Both communities expressed verbal support of the proposed research program.

Environment and Natural Resources (ENR) made a brief PowerPoint presentation at the Sachs Harbour Hunters and Trappers Committee annual general meeting in mid-July. Information was provided on the VM polar bear subpopulation survey project, ENR's interest in collaring five bears north of Norway Island in the NB subpopulation, as well as capturing and potentially collaring grizzly bears and hybrid bears encountered on Banks Island or within the NB polar bear subpopulation region. We aimed to address concerns expressed at the annual general meeting within this research application.

Paulatuk HTC (PHTC) members have expressed interest to expand the work into the area they hunt so this application was also sent to PHTC for approval.

In August of 2012 the project leaders attended the Inuvialuit-Inuit polar bear management meetings in Tuktoyaktuk, NWT where results of the first field season of the VM polar bear project were presented to the commissioners of the agreement from Ulukhaktok and Cambridge Bay. Research planning meetings were held in January 2013. ENR met with the OHTC and EHTO, and held public meeting in both Ulukhaktok and Cambridge Bay. During these meeting an overview of the 2012 field season was presented, followed by a discussion of methods to be used for future fieldwork.

Photo: GNWT/L. Cymbalisty, ENR

Viscount Melville Sound Polar Bear Subpopulation Survey

April 13, 2012 to June 1, 2012

MAIN INVESTIGATOR:

Jodie Pongracz, Regional Biologist, Environment and Natural Resources, GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005411

LOCATION:

Viscount Melville Sound, NWT.

The research was conducted over the sea ice within the Viscount Melville (VM) polar bear subpopulation boundary. The field crew worked from five base camps. Three base camps were Polar Bear Cabins located at Wynniatt Bay on Victoria Island, Cape Providence on Melville Island, and near Castel Bay in Aulavik National Park on Banks Island. The two other camps were temporary base camps located at Mould Bay on Prince Patrick Island and Nias Point on Melville Island. Research commenced on April 21, 2012 in Wynniatt Bay and was completed on May 31, 2012 at Polar Bear Cabin on Banks Island.

PARTNERS:

- Olokhatomiut Hunters and Trappers Committee in Ulukhaktok
- Ekaluktutiak Hunters and Trappers Organization in Cambridge Bay
- Inuvialuit Game Council
- Aboriginal Affairs and Northern Development Canada
- Environment Canada
- Government of the Northwest Territories
- Nunavut Wildlife Management Board
- Polar Continental Shelf
- Wildlife Management Advisory Committee (NWT)
- World Wildlife Fund

RATIONALE:

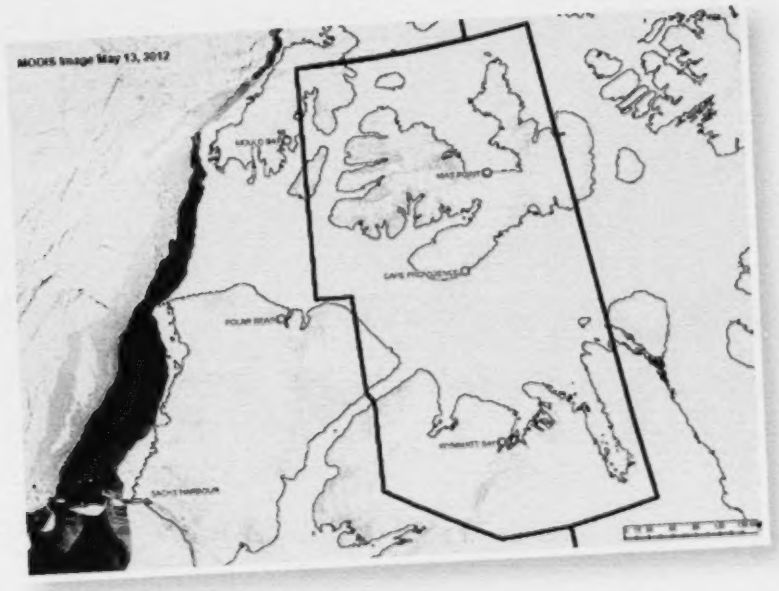
Sustainable management of harvested wildlife is dependent on current information concerning distribution, abundance and demographic parameters of wildlife populations. The most recent population estimate and demographic data for the VM polar bear subpopulation comes from mark-recapture research conducted from 1989-1992. In recent years, the sea ice in the VM region has shifted from a multi-year sea ice to an annual sea ice system, remaining ice free in late summer. Currently, it is not known how the VM polar bear population is responding to these observed changes in sea ice habitat. It has been suggested that a shift from a multi-year sea ice system to an annual sea ice system may benefit polar bears in the short term by increasing the productivity of the sea ice environment. In order to assess whether the current allocated harvest of seven bears a year can be changed, a more detailed understanding of how bears in this population are responding to changing sea ice conditions is required.

OBJECTIVES:

- To conduct mark-recapture to estimate the current population size and demographic parameters of the VM polar bear subpopulation;
- To assess the current boundaries of the VM polar bear subpopulation; and
- To assess polar bear habitat use of changing sea ice habitat in the area of VM Sound.

METHODS:

Survival, reproductive rates, and the size of the VM polar bear subpopulation will be determined using a three year traditional mark-recapture (i.e. immobilization and tagging of bears) method. This study will also involve the deployment of 25 satellite radio collars on adult female polar bears from the VM region to examine polar bear habitat use, distribution and movement rates,



Viscount Melville polar bear population study area.

and subpopulation delineation. This data will allow researchers to assess whether the existing boundary for the VM polar bear subpopulation is adequate and the extent to which polar bears use both multi-year and annual sea ice.

RESULTS AND MAIN CONCLUSIONS:

A total of 40 bears were marked in the VM subpopulation area. These bears were sighted in 24 groups (seven family groups, four mated pairs, and 13 lone individuals). Five of seven family groups were with COYs. Fourteen collars were deployed on adult female polar bears throughout the region.

During the VM survey we also sighted three grizzly bears and what we believe to be two hybrid bears.

LONG-TERM PLANS AND RECOMMENDATIONS:

We are currently planning for the spring 2013 and spring 2014 field seasons.

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COMMUNITY INVOLVEMENT:

Prior to research commencing, we held community consultations in both Cambridge Bay and Ulukhaktok. The objective of the meetings was to get direction from the Olokhatomiut Hunters and Trappers Committee (OHTC), the Ekaluktutiak Hunters and Trappers Organization (EHTO), and both communities as to whether they thought the research should occur and what methods should be used. Both communities and respective HTO/HTCs approved of the research and gave the Department of Environment and Natural Resources (ENR) direction to proceed with an initial year of traditional mark-recapture methods and to deploy 25 satellite-GPS collars on adult female polar bears.

In August of 2012 the project leaders attended the Inuvialuit-Inuit polar bear management meetings in Tuktoyaktuk, NWT where results of the first field season of the VM polar bear project were presented to the commissioners of the agreement from Ulukhaktok and Cambridge Bay.

Research planning meetings were held in January 2013. ENR met with the OHTC and EHTO, and held public meeting in both Ulukhaktok and Cambridge Bay. During these meetings an overview of the 2012 field season was presented, followed by a discussion of methods to be used for future fieldwork.

Photo: GNWT/R. Decker, ENR

Baseline Study on Black Bear Movements in the North Slave Region

2011 to 2012

MAIN INVESTIGATOR:

Dean Cluff, Regional Biologist, Environment and Natural Resources, GNWT, North Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500070

LOCATION:

The study area was the North Slave Region (NSR) with a focus on black bears along Highway 3. However, bears around Yellowknife and the Ingraham Trail (Highway 4) were also potential candidates for collaring and relocation.

PARTNERS:

- Renewable Resource Officers
- Environment and Natural Resources (North Slave Region)
- Community assistants, where possible

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RATIONALE:

No studies of black bears (*Ursus americanus*) in the NSR have been done, therefore very little information is known about these bears in the northernmost part of their range. This dearth of information was a limiting factor in assessing the impact of an outfitter's recent proposal to bait black bears for hunting. Concern was expressed that baits will habituate these bears to people and create conflicts. The NSR has also spent considerable effort in staff and equipment over the last 10-12 years responding to potential conflict situations between people and bears yet with little information gained. Whether baiting bears creates additional conflict situations with people is unknown. Public opinion favours moving bears rather than killing them, however this is not always possible. Bears that come in close proximity to people or their dwellings are assessed on a case-by-case basis as to what action to take. A bear can be immobilized and moved if public safety is not at risk. When safety is a concern, the bear is killed.

In 1998, NSR staff began immobilizing black bears in the Yellowknife area and moved some of them elsewhere. Relocated bears were ear-tagged, lip-tattooed, and measured prior to their release. These tags allowed unique identification of the bear, although only if the bear was later re-captured or killed. Coloured vinyl streamers were attached to one or both ears (e.g. "ear-flag") via the ear-tag at the time of capture to facilitate individual recognition from a distance after the bear's release. However, these ear-streamers were temporary and likely lost within a few weeks or months. A relocated bear marked in this way cannot be regularly tracked except if it returns to the area soon after its relocation. The cryptic and nocturnal behaviour of bears, whether ear-tagged or not, further complicates repeated monitoring. A more reliable method is needed to track bears once they are

relocated to evaluate if this technique of managing human-bear conflict is practical.

The harvest of black bears within the NSR is unknown but considered low. However, much of the harvest that occurs is facilitated by Highway 3 because of the access it offers to hunters. The highway cuts a major corridor through the Taiga Plains ecozone and also has numerous side access points with open areas. Black bears frequent the highway corridor in spring to feed and its impact on movements of bears in unknown. The highway could act as a population sink by being a seasonal attractant for bears but also rendering them vulnerable to spring hunting by people.

OBJECTIVES:

- To collect baseline information of black bear ecology, specifically on their movements and behaviour;
- To document the movements and range sizes of black bears in the northern boreal forest;
- To identify den site locations and black bear fidelity to them;
- To document movements and behaviour of black bears around highways and food attractants; and
- To provide management recommendations for relocating bears in the NSR.

METHODS:

Black bears were captured in summer of 2011 along Highway 3, but near Yellowknife and Behchokǫ̀ as opportunities permitted. Efforts to capture black bears were not made in summer 2012 because there were no incidents involving candidate bears for collaring. Capture was by culvert traps. Both solitary bears and family groups were targeted if the opportunity presented itself. Once chemically immobilized (via Telazol), bears were ear-tagged. The ear-punch disk will be used as a biopsy marker. A hair sample (with follicles) will be taken for a genetic identifier. Uniquely marking cubs in family groups will be critical to determining if cubs brought to garbage or bait sites by their mother become more likely to get into conflict situations later once on their own.

Adult bears captured were collared with a GPS/Iridium radio collar to allow their movements to be tracked intensively (1 GPS location/30 minutes) for two years (May-October each year), given that the collar will be silent during winter hibernation. These duty cycles will make possible the mapping of detailed movement paths for monitored bears. Three GPS/Iridium collars were deployed in fall 2011 and four collars are available for deployment in 2012. A programmable collar release mechanism was attached to each collar so no recapture would be needed for collar removal. A VHF (Very High Frequency) beacon was included in the collar to facilitate its retrieval after drop-off. Bears captured and collared would be in response to managing potential conflict situations where bear sightings have occurred. The relocation site was the same for all bears and was accessed near km 154 on Highway 3.

GPS collars obtained locations with a resolution of about two to five meters. Location data was transmitted daily to the Iridium satellite system after every 18 locations and emailed to the Project Leader. Locations were also stored in the collar's memory. Collars were programmed to be silent during winter hibernation but then turn on again after spring den emergence. Radio-tracking each bear once over the fall or winter via the VHF beacon would confirm the bear's denning location. Collars were programmed to drop off in late October of the second year. It was hoped the late drop-off could identify the den area for the second year to help determine fidelity to denning locations.

RESULTS AND MAIN CONCLUSIONS:

Only three collars were deployed in 2011 but their movements have been of great interest to see what these bears will do. These bears, while not "problem" bears, were frequenting areas where people were and subsequently were caught in culvert traps and relocated before conflicts could occur. Behchokǫ̀ Wildlife Officer Kotchilea assisted in two of three relocations and release.

Although only based on three individual black bears, their movements after relocation were consistent with expectations. That is, the two sub-adult males moved about slightly after relocation and appeared to establish a home range in the area soon after relocation. Conversely, the adult male bear wandered extensively after its relocation, and swam across the North Arm of Great Slave Lake in mid-October 2011, after which the collar failed to function. This adult male bear found its way back to where he was captured, which was confirmed by sightings of a collared bear by the public and our follow-up radio-tracking of its VHF signal. Once back in the area where it was captured, the bear appeared to remain in the area, based on two follow-up flights to track its VHF signal in summer 2012.

LONG-TERM PLANS AND RECOMMENDATIONS:

The program has been suspended. So far only three GPS collars have been deployed and the batteries have since reached their end-of-life. The other four collars could not be deployed last year because no candidate bears for collaring were captured. Low sample size is an inherent problem in such a relocation monitoring program, and greater support is required before it can continue.

COMMUNITY INVOLVEMENT:

Letters and comments have been received by the Wek'èezhìi Renewable Resources Board (WRRB) in response to the Department of Environment and Natural Resources notice on the bear baiting proposal by True North Safaris. This study acted on some of those concerns. A presentation on black bear research and monitoring was given to the WRRB at their board meeting in December 2011. Cabin owners along Highway 3 assisted the project by agreeing to have a bear trap nearby and securing their dogs. The Ingraham Trail Property Owners Association was briefed on the project; however, no candidate bears were captured in the area.

Joint Regional Grizzly Bear DNA Hair Snagging Program

June 2012 to September 2012

MAIN INVESTIGATOR:

Claudine Lee, Superintendent Environmental Operations, Dominion Diamond Ekati Corporation; David Wells, Superintendent Environment, Diavik Diamond Mine Inc.

WILDLIFE RESEARCH PERMIT NUMBER:

WL500068

LOCATION:

The joint regional grizzly bear DNA program will occur over approximately 16,000 km^2 of the Lac de Gras region, approximately 300 km NE of Yellowknife, NWT. Dominion Diamond Ekati Corporation (DDEC) is located at 64° 40'N 110° 43'W and Diavik Diamond Mine Inc. (DDMI) is located at 64° 30'N 110° 17'W.

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RATIONALE:

Potential direct and indirect impacts to barren-ground grizzly bears associated with mining activities are assumed to be minimal, but without detailed information about population status, testing this assumption, particularly in relation to indirect effects, is difficult. Recommendations from regulators and monitoring agencies at a technical workshop held on June 28, 2010 and from communities at workshops held on September 22 and 23, 2010 and October 5 and 6, 2010, included that the mining industry collaborate together on a large scale regional grizzly bear program to assess population status and monitor trends over the long term. These workshops were followed by a grizzly bear working group meeting held on November 2, 2011 in Yellowknife to examine study design options for a regional DNA program. The working group included representatives from the communities, the mining companies, regulators and monitoring agencies. DDEC and DDMI have agreed to work together on a regional-scale, multi-year grizzly bear DNA mark-recapture program, commencing May 2012.

OBJECTIVE:

- To determine if mine-related activities influence the relative abundance and distribution of grizzly bears over time.

METHODS:

Study Area

A grid pattern of 12x12 km cells will be utilized based on an approximation of a two-week home range of female barren-ground grizzly bears. The 12x12 km grid consists of 111 cells (~16,000 km^2). The final number will depend on a desk top exercise that will omit those cells that are predominantly under water or otherwise contain inherently poor grizzly bear habitat (e.g. >80% boulder field).

Sampling Frequency

Home ranges and movements are considerably larger amongst barren-ground grizzly bears, and their densities are much lower than populations further south. There will be six sampling sessions to occur approximately between early June and late August. Each sampling session will be no longer than two weeks as sample degradation has been observed in samples left uncollected for more than fourteen days.

Hair Collection

A wooden tripod with a fixed base and the legs wrapped in barbed wire will be used to collect grizzly bear hair. Within each cell, the wooden tripod will be located at an area of high quality grizzly bear habitat to increase the likelihood of collecting bear hair. Non-reward lures will be used to attract bears to the tripods. The posts will not be relocated between each sampling period; therefore, a novel scent combination will be used each session to prevent habituation.

RESULTS AND MAIN CONCLUSIONS:

Results and main conclusions were not submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans and recommendations were not submitted.

Cooperative Waterfowl Population Surveys in the Northwest Territories

May 2012 to June 2012

MAIN INVESTIGATOR:

Jim Wortham, Chief of Waterfowl Population Surveys, United States Fish and Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL500058

LOCATION:

The surveys cover much of the Mackenzie Valley region from the southern border of the NWT to the Mackenzie Delta Region.

PARTNERS:

- United States Fish and Wildlife Service
- Canadian Wildlife Service

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RATIONALE:

The NWT is one of the most important breeding and summering areas for ducks, geese, and swans in North America. Information on bird numbers, distribution, and population trends is needed to determine if current local and international harvest levels are sustainable and to ensure that populations are conserved for the long-term use and appreciation by northern residents and all the other people residing within the migratory range of these species.

OBJECTIVES:

- To determine the size and species composition of the breeding populations of ducks and other waterfowl in Mackenzie River drainage.

METHODS:

The survey procedure involves flying a single pass along straight transects in a single engine Kodiak aircraft at a height of 150 ft. The procedures followed in conducting this survey are contained in the *Standard Operating Procedures for Aerial Waterfowl Breeding Ground Population and Habitat Surveys in North America, Section III, revised 1987* document.

Two observers record all waterfowl species observed within 200 m (or 660 ft.) on each side of the aircraft. All observations are georeferenced and can later be summarized at transect, strata, provincial/territorial and continental levels.

RESULTS AND MAIN CONCLUSIONS:

Habitat conditions for breeding waterfowl in the NWT were mostly good in 2012. Temperature and precipitation were generally average to slightly above average, with higher rainfall amounts towards Inuvik. Wetlands were fully charged and some basins along the last few northern transects were outside their borders. No ice

jams were observed on the Mackenzie River in 2012 and delta habitats were not flooded, unlike conditions in 2011.

The 2012 total breeding duck estimate in central and northern Alberta, northeastern British Columbia, and the NWT was 24% higher than the 2011 estimate and the long-term average (1955-2011). Mallard numbers were 59% higher than 2011 and 44% higher than the long-term average. The American wigeon estimate was similar to 2011 and 24% lower than the long-term average. Green-winged teal were similar to 2011 and 99% above the long-term average. Northern shovelers were 107% above the 2011 estimate and similar to the long-term average. Northern pintails were similar to 2011 and 78% below the long-term average. Canvasbacks were similar to last year and to the long-term average. Scaup were 31% higher than last year and similar to the long-term average.

The *2012 Waterfowl Population Status* report as well as previous status reports can be accessed online at:

www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus.html.

LONG-TERM PLANS AND RECOMMENDATIONS:

The waterfowl population survey program has evolved into the largest and most reliable wildlife survey effort in the world. For more than 50 years, cooperative waterfowl surveys have been performed by United States Fish and Wildlife Service (USFWS), Canadian Wildlife Service (CWS), state and provincial biologists and non-government partners. Survey results determine the status of North America's waterfowl populations, play an important role in setting annual waterfowl hunting regulations, and help guide the decisions of waterfowl mangers throughout North America.

These surveys are to continue until a more cost effective way is discovered to manage the North American waterfowl population.

COMMUNITY INVOLVEMENT:

CWS has reviewed all concerns and comments provided by the communities and has discussed solutions directly with them. The main concerns received by the communities are opportunities for local hiring and disturbance to wildlife.

The USFWS is unable to hire local help because of liability and legal issues as well as constraints in the United States civil service hiring regulations. It is expected that the surveys will have a negligible effect on waterfowl and other wildlife because transects are widely spaced over a vast area and areas are only surveyed once annually.

2012 Waterfowl Population Status Report.

Population Management of Geese and Swans in the Inuvialuit Settlement Region Using Aerial Surveys and Banding Studies

Summer 2012

MAIN INVESTIGATOR:

Myra Robertson, Waterfowl Population Biologist for the Western Arctic, Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL005412

LOCATION:

Since 1989, the Canadian Wildlife Service (CWS) has conducted aerial surveys and banded geese throughout the Inuvialuit Settlement Region (ISR), NWT, to monitor the abundance and productivity of geese and swans in the area.

Goose banding operations took place at the Mackenzie Delta, Tuktoyaktuk Peninsula and Anderson River Delta.

Surveys of snow geese were done at the Kendall Island and Anderson River colonies.

PARTNERS:

- Wildlife Management Advisory Council (NWT)
- Polar Continental Shelf Project
- Mississippi Flyway Council
- United States Fish and Wildlife Service (USFWS)
- Arctic Goose Joint Venture
- Canadian Wildlife Service (CWS)

RATIONALE:

The ISR of the western Canadian Arctic is an important breeding and moulting area for the greater white-fronted goose, Canada goose, lesser snow goose, brant, tundra swan, and several other species of waterfowl. Information on bird numbers, distribution, habitat requirements, survival, and productivity is needed to determine if current local and international harvest levels are sustainable and to ensure that populations are conserved for the long-term use by the Inuvialuit and others.

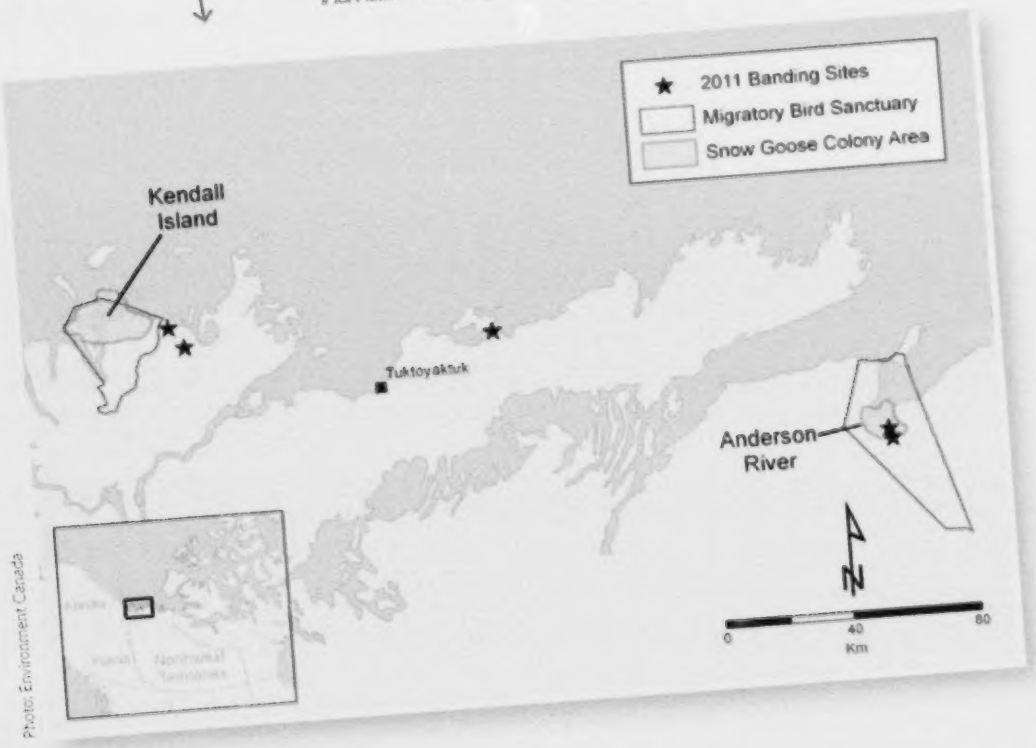
At a continental level, recent harvests of greater white-fronted geese have been high and estimates of survival rates have been low. Banding studies assist in determining the continental distribution, migration routes, longevity, and harvest rates of geese. Banding of greater white-fronted geese was conducted on the mainland of the ISR from 1990-1995 to determine these rates, and was resumed in 2008-2012 to monitor any changes.

Snow geese are an important species for subsistence harvest for Inuvialuit residents and there is local interest in the status of the Kendall Island and Anderson River nesting colonies. Helicopter surveys at these colonies are being conducted at approximately three-year intervals to determine the colony size and productivity at each location.

OBJECTIVES:

- To monitor waterfowl populations in the ISR;
- To evaluate the effect of harvest and other stressors on western Arctic populations of waterfowl; and
- To monitor migration routes, harvest rates, and survival rates of the ISR mainland goose populations.

Banding locations of geese in the Inuvialuit Settlement Region



METHODS:

In July, flightless moulting adult geese were captured using a helicopter to drive the birds into a netted enclosure. Each goose was banded with an individually-numbered metal leg-band. Information about banded birds submitted by hunters helps determine the migration routes, seasonal distributions, survival, and harvest rates for these birds.

Helicopter surveys for snow geese were conducted at the Kendall Island and Anderson River colonies in June and July. The June survey provides an estimate of the number of nesting geese and the July survey provides an estimate of the numbers of successful breeders and young birds.

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RESULTS AND MAIN CONCLUSIONS:

In July 2012, we banded 1,292 greater white-fronted geese, 80 Canada/cackling geese, and one blue goose (i.e. a snow goose in the bluish-grey colour phase). We also recaptured 61 greater white-fronted geese that had been previously banded. Birds were caught at the Mackenzie Delta, Tuktoyaktuk Peninsula, and Anderson River.

Over 5,500 greater white-fronted geese have now been banded on the mainland of the ISR in the last five years. Band returns from southern hunters and northern Aboriginal harvesters are being used to determine the temporal and geographic distributions of these geese in fall, winter, and spring. This information will also be compared to previous distribution and survival

Greater white fronted-geese waiting to be banded

Photo: Environment Canada

information from greater white-fronted geese banded in the ISR from 1990-1995, as well as to information from greater white-fronted geese currently being banded in the central Canadian Arctic and Alaska.

A few feathers were collected from 92 greater white-fronted geese. These feathers are for a continental study to see whether isotope analysis (i.e. the chemical signature on the feathers) can be used to determine recent moulting locations.

Although a total of 2,186 snow geese were seen at the Kendall Island colony in June, few of these birds were observed to be nesting. A later survey confirmed that it was a poor nesting year for geese at the Kendall Island colony, with only 239 adults and 94 young observed in July. Productivity at Anderson River was reasonable in 2012. In June, 2,323 adults were observed at the colony. In July, 2,677 adult and 1,192 young were seen. This is comparable to numbers seen at Anderson River in recent years.

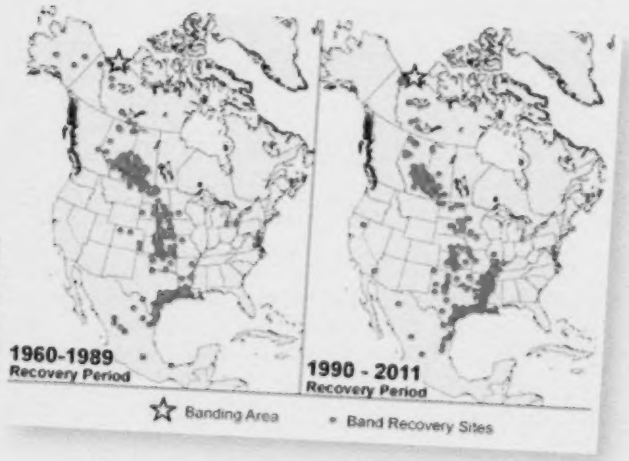

Photo: Environment Canada

Recovery locations of greater white-fronted geese

LONG-TERM PLANS AND RECOMMENDATIONS:

Preliminary analysis of the banding data from greater white-fronted geese suggests that five years of banding is adequate to calculate current survival and harvest rates. As such, banding is not planned for 2013.

The numbers of snow geese at the Banks Island colony are counted periodically (about every five years) through air photo surveys carried out in collaboration with the USFWS. Anderson River and Kendall Island are also surveyed at the same time. Photographic surveys of the Banks Island, Anderson River and Kendall Island colonies are planned for June 2013.

COMMUNITY INVOLVEMENT:

CWS has reviewed all concerns and comments provided by the communities and discussed solutions directly with them. The main concern received by the communities was the opportunity for local hiring. The banding operations rely on transportation by helicopter and are weight restricted. This limits the number of passengers, banding gear and fuel that can be carried at one time as well as distance travelled before refueling. Although it did not work out to hire local help in 2012 for banding, we will continue to work with the communities to enable opportunities for local participation.

Arctic Shorebird Monitoring Program

June 2012 to July 2012

MAIN INVESTIGATOR:

Jennie Rausch, Shorebird Biologist, Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL005413

LOCATION:

Banks and Western Victoria Islands: Short-term study (June 15 to July 1, 2012).

Banks Island survey crew was based from a temporary tent camp located near the Bernard River, 73° 22.88'N, 122° 42.37'W. The Victoria Island survey crew was based from a temporary tent camp along the Kagloryuak River, 70° 09.83'N, 110° 17.58'W. Survey plots were randomly selected across Banks Island and NWT portion of Victoria Island.

Mackenzie Delta: Long-term study (June 3 to July 8, 2012).

Temporary tent camp established at Taglu Tower (Fish Island), 69° 22'15"N, 134° 53'16"W. Survey Plots: Kendall Island Bird Sanctuary and the surrounding area (69° 30'N to 69° 9'N and 135° 41'W to 134° 33'W).

RATIONALE:

Populations of Arctic breeding shorebirds are facing widespread declines. The Arctic Shorebird Monitoring Program was initiated in response to widespread shorebird population declines noted on migration routes through southern Canada and United States. In order to identify the causes of this decline, it is critical to study shorebird populations and population dynamics on their breeding grounds, where more accurate population estimates can be obtained. This involves counting birds, and studying their nest success, chick survival rates, adult survival, breeding site fidelity and population age structure.

This program aims to produce population estimates for Arctic breeding shorebirds and to monitor trends in their populations over time. Our work involves two different survey types—short-term snap shot surveys, or "rapid surveys" conducted over broad areas, and long-term, high resolution "intensive" surveys conducted in a localized area. We carried out short-term surveys on Banks and western Victoria Islands this past summer. We also returned to the Mackenzie Delta for the eighth consecutive year to conduct long-term surveys. Our work at this location is a component of the Arctic Shorebird Demographic Network (ASDN). Our Mackenzie Delta site is one of three participating localities in Canada and one of 12 across Arctic North America — part of a multi-jurisdictional cooperation to determine causes of shorebird population decline.

OBJECTIVES:

This project is part of a larger program called the Arctic Program for Regional and International Shorebird Monitoring (Arctic PRISM). The purpose of the program is:

- To generate population estimates for all Arctic breeding shorebirds;

Photo: L. Pirie, Environment Canada

A whimbrel about to be released after being banded.

Photo: K. Jones, Environment Canada

A shorebird chick being weighed on a scale.

- To produce maps showing shorebird distribution and abundance across the North American Arctic;
- To identify highest-quality habitats for each shorebird species;
- To provide shorebird densities and breeding ecology information at each survey site; and
- To assist local managers in meeting their conservation goals.

The Mackenzie Delta site is also part of the Arctic Shorebirds Demographic Network, whose objective is:

- To determine the demographic factors limiting bird population growth;
- To document patterns of species presence and abundance and historical change;
- To document season patterns of nest initiation, habitat use and species assemblages;
- To collect environmental information including predation and prey availability; and
- To correlate data from objectives one through four to assess impacts of climate change and cumulative impacts on shorebird breeding ecology and population size.

METHODS:

Short-term Arctic-wide surveys

Rapid surveys were conducted in 62 plots on Banks Island, and 57 plots on Victoria Island. The plots are 12 ha in size and were surveyed on foot, but accessed by helicopter. Rapid surveys involve walking systematic

PARTNERS:

- Canadian Wildlife Service
- Program for Regional and International Shorebird Monitoring (PRISM)
- Manomet Centre for Conservation Sciences
- Neotropical Migratory Bird Conservation Act (United States Government)
- Center for Conservation Biology (College of William and Mary; and Virginia Commonwealth University, Virginia, USA)
- Polar Continental Shelf Program, Natural Resources Canada

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transects through plots and recording the number and species of shorebirds that are observed within the plot boundaries. If nests are encountered within plots, they are examined for number of eggs and/or chicks, flush distance (how close we are when the incubating parent gets up off the nest), and other nest characteristics like how exposed or concealed the eggs are. In addition, habitat characteristic (such as landscape features and vegetative cover) are recorded for each plot. Any red knots (a shorebird species that is federally listed under the *Species at Risk Act*) encountered would have been banded, and small blood and feather samples collected to determine subspecies; however, we only saw two red knots this year on our surveys and did not capture them.

Long-term surveys

In the Mackenzie Delta, three 12 ha plots were intensively surveyed on Taglu, Fish, and Niglintgak Islands. In conjunction with these plots, five larger (90-220 ha) ASDN plots were surveyed in a similar fashion. These plots were accessed by foot and/or zodiac boat.

These surveys require long hours spent in the plots observing shorebirds and recording their habits, nesting and hatching success as sites are monitored in five day intervals. Additionally, climate-related variables (such as pond water level and temperature) and predator/prey abundance are monitored throughout the field season.

Adult and juvenile (young of the year) shorebirds, including Hudsonian godwit, red-necked phalarope, semipalmated sandpiper, semipalmated plover, stilted sandpiper, least sandpiper, and whimbrel were banded this year. They were banded with a stainless steel unique number band and a white colour flag that indicates the bird was banded in Canada. Birds were also banded with a combination of colour bands which allow for identification of individual birds during the field season and subsequent field seasons. Some whimbrels were

Hudsonian godwit, a species of shorebird found in the Mackenzie Delta

Photo: L. Pirie, Environment Canada

also fitted with a small geolocator (attached to a leg band). It tells us where the bird has been and helps us understand where they are passing through on migration. When possible, blood, feathers, and fecal samples were collected for genetic and isotopic analysis. These practices allow for a better understanding of where birds are migrating, where they are spending the winter, which birds are related to each other, and if they are picking up contaminants along their migration routes. Knowing this information can help us to make decisions on the conservation of species that are at risk or are in danger of becoming at risk.

RESULTS AND MAIN CONCLUSIONS:

Short-term Arctic-wide surveys

The Banks Island crew surveyed a total of 62 plots (744 ha) from June 15-26. Of the 912 birds recorded within the plots, 78 individual shorebirds were observed, consisting of nine species. The majority of these were American golden plover, pectoral sandpiper, and ruddy turnstone, which accounted for 43 of the 78 shorebirds encountered during surveys. A total of 26 nests were observed in our Banks Island plots, with seven nests belonging to shorebirds. These included one semipalmated plover, two white-rumped sandpiper, two American golden plover, and two black-bellied plover nests.

The Victoria Island crew surveyed a total of 57 (684 ha) plots from June 15 to July 1. A total of 213 birds were encountered within the Victoria Island plots. Of these, 127 individuals were shorebirds consisting of 12 different species. Over half of these shorebirds were pectoral sandpiper and semipalmated sandpiper. Baird's sandpiper and American golden-plover were also numerous. Together, these four species accounted for 77% of the total shorebirds we saw in our plots. We found 39 shorebird nests, 70% of which were pectoral sandpiper and semipalmated sandpiper nests.

Long-term surveys

A total of 72 shorebird nests were observed in our Mackenzie Delta plots this year; within a combined area of 713 ha. The most common nests found belonged to red-necked phalarope, semipalmated sandpiper, and whimbrel. We also observed American golden-plover, Hudsonian godwit, long-billed dowitchers, pectoral sandpiper, semipalmated plover, and stilt sandpiper. Of the 72 shorebird nests we monitored, 12 nests hatched before we closed camp and left for the summer. Twenty-six nests of these 72 nests failed, which is more than

Photo: L. Pole, Environment Canada

Ruddy turnstone

normal; however, there was also more fox activity than in previous years and foxes eat shorebird eggs.

Forty-nine adult shorebirds and 39 chicks were banded. This year we re-sighted 26 shorebirds that had been banded in previous years — these observations contribute valued information about migration paths, but also shorebird behaviour. For example, a semipalmated sandpiper adult was resighted this year that was banded as a chick two years ago, and had returned to the Mackenzie Delta to nest as an adult — a phenomenon referred to as natal philopatry. We also noted that a Hudsonian godwit returned to the same nesting site on Fish Island where it had nested the year before, a behavior known as nest site fidelity. From the shorebirds we banded, we were able to collect 42 blood samples, 45 feather samples, and 27 fecal samples for genetic and isotopic analysis.

LONG-TERM PLANS AND RECOMMENDATIONS:

The shorebird camp in the Mackenzie Delta is one of two Arctic PRISM Tier 2 (long term) shorebird

monitoring sites in Canada. It is also part of the ASDN which is drawing together Arctic breeding shorebird demographics from a variety of sites spread around the Arctic, using a standard set of protocols so the data can be part of a central database. After we have several years of data collected, we will be able to analyze it across the ASDN and see if we can find any explanations for the causes of shorebird population decline, and effects of climate change on breeding birds.

We also maintain this site as part of baseline monitoring for the Mackenzie Gas Project (MGP). Should the MGP be approved, we will have a complete bird dataset necessary to monitor the impact of development on shorebirds breeding in the affected area as MGP progresses.

The short-term Arctic wide surveys will be continuing across the Canadian Arctic. The majority of the work occurs in Nunavut because there is a greater amount of true tundra in Nunavut, but we still need to complete surveys in the high Arctic portion of NWT (Prince Patrick and western Melville Islands), and on the mainland between Paulatuk and the NWT-NU border at some point in the next decade.

COMMUNITY INVOLVEMENT

Over the last eight years, CWS Shorebird Program has hired nine students from local communities including Fort McPherson, Yellowknife, Inuvik, and Tuktoyaktuk to work as part of our field team. Our research is supported by the Wildlife Management Advisory Council (NWT), the wildlife management board for the ISR. We regularly communicate with the Hunters and Trappers Committees (HTCs) in Inuvik and Tuktoyaktuk about our project and to obtain recommendations for research. This year, as part of CWS's mentoring program in Nunavut (Inuit Field Research Assistant Program), we had a student from Clyde River, NU being mentored, and she accompanied the crew to the Mackenzie Delta field site. We also had a university and high school student from Yellowknife accompany the crew based on western Victoria Island as a career experience project.

We produced a newsletter that was sent to all the ISR HTCs, as well as all schools and community organizations in the NWT every two to three years that details our activities since the last edition, and provides preliminary results. Summaries of the 2012 field season have been sent to the Inuvik, Tuktoyaktuk, Sachs Harbour and Ulukhaktok HTCs and if there is enough interest, we will follow these letters with a community visit.

Breeding Bird Surveys in the Gwich'in Settlement Area

June 2012 to September 2012

MAIN INVESTIGATOR:
Wayne Condon, Aurora Research Institute, Fort Smith, NWT

WILDLIFE RESEARCH PERMIT NUMBER:
WL005414

LOCATION:
Four breeding bird survey routes near the communities of Fort McPherson, Inuvik and Tsiigehtchic were completed.

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OBJECTIVES:

- To collect information about species at risk in the Gwich'in Settlement Area and provide the data to the Species at Risk Stewardship Program and the local Renewable Resource Councils (RRCs);
- To collect information about breeding birds in the region on breeding bird survey routes 043-001, 002, 003 and 004 that were vacant (i.e. no surveyors were scheduled to complete the routes in 2012);
- To provide the data collected to the Canadian Wildlife Service (CWS) for inclusion in the North American-wide breeding bird surveys program to determine long-term population trends; and
- To provide training for local field assistants so they may survey the routes in future years.

METHODS:

A total of 182 individual surveys were completed on four routes along the Dempster Highway. These surveys were part of North American-wide breeding bird surveys which were started in the 1960s to monitor long-term trends in bird populations. The method employed to conduct the surveys was to record all birds seen and heard within 400 m of individual point count locations during three minute periods along each of the four routes. Survey locations were 800 m apart and the routes were 40 km long allowing for 50 stops per route. The surveys were conducted from 3:30 a.m. to 10:00 a.m. At each stop, the time, temperature, wind speed and sky conditions were also noted. Exceptions to this protocol included route 043-002 where only 33 stops were surveyed due to bad weather (to conduct breeding bird surveys there must be little wind and only light showers); and route 043-004 where 49 stops were made before arriving at the town of Inuvik.

RESULTS AND MAIN CONCLUSIONS:

Fifty different bird species were observed on all four routes. The most common bird species observed on all four routes were, in descending order: yellow warbler, white-crowned sparrow, common redpoll, alder flycatcher, Savannah sparrow, yellow-rumped warbler, and American robin. Other birds that were observed included seven species ranked as Sensitive in the NWT; lesser scaup, white-winged scoter, lesser yellowlegs, short-eared owl, blackpoll warbler, American tree sparrow and rusty blackbird (ENR 2011). Sensitive wildlife species are those "that are not at risk of extinction or extirpation but may require special attention or protection to prevent them from becoming at risk" (ENR 2011). A total of 744 individual birds were observed on all four routes.

Four species of birds were observed outside of the scheduled three minute point counts. A short-eared owl was observed hunting between stops two and three on route 43-001. On route 43-004, a tundra swan was observed between stops 16 and 17, a northern harrier was seen flying at stop 28, and a peregrine falcon (unconfirmed) was observed flying between the trees at stop 30. Another species at risk, a grizzly bear, was observed running away from the highway approximately halfway through route 43-001.

Monitoring bird populations is an important tool to identify where species at risk are located and for assessing the conservation status of other species.

LONG TERM PLANS AND RECOMMENDATIONS:

Data needs to be collected on an annual basis to enable the long-term assessment of bird population trends over time. It is recommended that the surveys be completed on an annual basis. To allow this to happen, trained local surveyors must be available to complete the work. Ideally, surveyors should have knowledge of and experience with bird point counts. A program should be implemented to train community members to conduct these surveys and ENR should consider investing funds to ensure on-going surveys.

COMMUNITY INVOLVEMENT:

Two field assistants from each of the three communities helped complete the surveys by navigating to the stop locations and timing the three minute-long surveys. They were shown how to use a handheld GPS and taught how to identify some birds by song. Each assistant received $200/survey day for their help. If funding is obtained next year, it is anticipated that the same field assistants will participate again. Bird song recordings were mailed to the assistants after the project to allow them to learn the songs over the next year. By providing training, it is hoped that some (or all) of the assistants will be able to take over the routes in future years.

The principal of the high school in Fort McPherson was contacted to arrange a presentation to high school students about the project as requested by the local RRC. Unfortunately, no time could be arranged to do the presentation during the brief stop in Fort McPherson.

Financial support for this project was provided by the Species at Risk Stewardship Program and the Aurora Research Institute. The local Renewable Resource Councils provided support by completing recommendation forms and CWS also offered a letter of support.

Abundance and Productivity of Waterfowl and Other Aquatic Birds Breeding in the Boreal Forest

May 2012 to August 2012

MAIN INVESTIGATOR:

Myra Robertson, Waterfowl Population Biologist for the Western Arctic, Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL500038

LOCATION:

Surveys were conducted near Yellowknife, NWT on a 38 km^2 area that borders Yellowknife Highway 3.

PARTNER:

- Canadian Wildlife Service

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RATIONALE:

Every spring, millions of breeding waterfowl and other aquatic birds are attracted to the boreal forest. It is one of the most important breeding habitats for waterfowl in North America, second only to the 'prairie pothole' region. The boreal forest becomes increasingly important during years of drought in the prairies, when it acts as a haven for ducks that might otherwise nest further south. However, this region is increasingly threatened by a wide range of stressors including resource development and climate change. Declines in populations of boreal nesting species, such as scaup and scoters, have been detected at a continental scale.

There is a lack of information on the ecology of northern ducks and other aquatic birds such as grebes and loons, and the contribution of boreal populations to the overall North American populations of aquatic birds is largely unknown. Similarly, the factors influencing the size and productivity of northern duck populations are poorly understood. Long-term monitoring data are required for the conservation of northern bird populations. Our results inform management decisions by providing valuable information on population trends and productivity of these northern birds.

The western population of horned grebe has been assessed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and this is one of the few long-term monitoring studies on this species in North America.

OBJECTIVES:

- To monitor population trends and productivity of boreal waterfowl and aquatic bird populations near Yellowknife; and
- To determine factors that limit the size, composition, and productivity of the breeding populations of aquatic birds near Yellowknife.

Photo: Environment Canada

Scaup observed on a pond.

Photo: Environment Canada

Canoe surveys along the lakes in the North Slave region.

METHODS:

Since 1985, the Canadian Wildlife Service (CWS) has gathered information on the abundance and productivity of waterfowl and other birds on the study area. Ponds within 400 m of the road were surveyed intensively on foot or canoe once a month from May until August. May and June surveys provided an estimate of breeding pairs for early and late migrant waterfowl, respectively. The surveys during July and August were used to estimate waterfowl production on the study area. During surveys, all ducks sighted on the ponds were recorded according to species, sex, and social status (lone, paired, or flocked). The number of ponds surveyed has been reduced from 575 to 353 because of the increased effort required to survey these ponds due to the reconstruction of Highway 3, which hindered access to certain areas on our study area.

RESULTS AND MAIN CONCLUSIONS:

The number of ring-necked duck, mallard, and American wigeon pairs observed in 2012 was higher than the long-term average (1985-2012). Numbers of lesser scaup and American green-winged teal were below average, whereas bufflehead was similar to the long-term trend.

Duckling production was well above average for lesser scaup, ring-necked duck, mallard, American wigeon, bufflehead, and American green-winged teal, making 2012 one of the best years for duck production on record. Overall, more duck broods were observed in 2012 than any other year since surveys began in 1985.

The number of horned grebe pairs observed was below average in 2012. Despite this, a good number of young resulted in production that was about average. The number of red-necked grebe pairs was above average with the number of young observed indicating average production this year.

LONG-TERM PLANS AND RECOMMENDATIONS:

Future plans are to continue monitoring boreal waterfowl and aquatic bird populations near Yellowknife at two-year intervals, with the next survey in 2014.

COMMUNITY INVOLVEMENT:

CWS in Yellowknife hires local summer students with backgrounds in biology or renewable resources to assist in the field and office. Joshua Sullivan, a summer student with CWS, assisted with data collection in 2012.

Western Canada Cooperative Banding Program

Summer 2012

MAIN INVESTIGATOR:

Jon Klimstra, Wildlife Biologist, United States Fish and Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL500060

LOCATION:

Stagg River delta, approximately 13 miles southeast of Behchokǫ̀, NWT.

PARTNER:

- Canadian Wildlife Service

CONTACT:

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RATIONALE:

This station is one of approximately 20 banding stations in Western Canada that band preseason waterfowl in the support of waterfowl management in North America.

OBJECTIVES:

- Preseason banding of 2,000 mallards, 1,500 northern pintails and 1,000 of all other waterfowl species at each of the approximately 20 banding stations in western Canada.

METHODS:

Swim-in bait traps will be used. Traps: 8'x8'x4' - 1"x2" mesh welded wire with loafing platforms. Bait: approximately 4,000 lbs. of "cleaned" Canadian barley will be used.

RESULTS AND MAIN CONCLUSIONS:

In 2012, the Stagg River station banded 1,013 ducks including: 470 mallards, 257 American green-winged teal, 27 American wigeon, 2 blue-winged teal, and 275 northern pintail.

Final project report submitted to North Slave Regional Office.

LONG-TERM PLANS AND RECOMMENDATIONS:

This station will continue to be operated and band pre-season waterfowl.

COMMUNITY INVOLVEMENT:

Since the inception of this station we have utilized local business for lodging, fuel, groceries, and supplies.

Photo: United States Fish and Wildlife Service

United States Fish and Wildlife biologists who assisted with waterfowl banding at Stagg River, NWT.

United States Fish and Wildlife map of waterfowl transects.

Breeding Densities and Population Trends of Tundra Birds at Daring Lake, NWT

May 2012 to September 2012

MAIN INVESTIGATOR:

Joachim Obst, Yellowknife, NWT

WILDLIFE RESEARCH PERMIT NUMBER:

WL500062

LOCATION:

The study was conducted from May 30 to September 4, 2012, at the Tundra Ecosystem Research Station (TERS) located at Daring Lake and managed by the Department of Environment and Natural Resources (ENR), Government of the Northwest Territories (GNWT).

PARTNERS:

- The study was sponsored in kind by ENR. The three-month long field surveys were volunteered by the primary investigator and observer Joachim Obst at his own expense.

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RATIONALE:

The project was conducted to monitor changes in the breeding populations of all species of birds nesting on the tundra because the populations of some species appeared to be declining while others were increasing over the years in the TERS study area. In addition, considerable natural population fluctuations of some species were observed during past years and some new species of birds moved into the area.

The project also was conducted because 30% of all 80 species of birds recorded at TERS Daring Lake are ranked as Sensitive in the NWT (Working Group on General Status of NWT Species 2006-2010) including four species assessed as Special Concern by COSEWIC (Committee on the Status of Endangered Wildlife In Canada). The status of other breeding bird species at TERS is Undetermined in the NWT.

The bird surveys at TERS provide important data for monitoring bird population trends on the tundra as well as data on the shifting of nesting habitats due to climate change.

OBJECTIVES:

- To record breeding densities, habitats and population trends of tundra birds;
- To use the data for monitoring the state of the environment and for conservation efforts;
- To provide the data as an educational and research tool online for public use; and
- To collect moulted and beached feathers of loons for contaminants analysis.

METHODS:

Breeding birds in the study area were observed and recorded during ground surveys on foot. A high resolution satellite image of the TERS study area was used to plot the locations of nesting birds and their territories.

Least sandpiper walking along the lake shoreline.

Photo: J. Obst

RESULTS AND MAIN CONCLUSIONS:

In 2012, two new species of birds were added to the Daring Lake Bird Check List thus raising the total number to 80 species observed in the study area. The list includes 48 confirmed breeding species, two suspected breeders, 13 species of rare or uncommon summer residents, 14 species migrating through the study area and resting or feeding there, and three species of rare vagrants in the summer. A total of 1,456 territories occupied by nesting pairs of all species of land birds were identified on plots and transects in the study area in 2012 and digitized on the 1 m resolution vegetation classification map.

The spring arrival of songbirds and shorebirds started in mid-May 2012, and was two to three weeks earlier than normal. Some songbirds already had nests, eggs or hatchlings on May 30 about one to two and a half weeks earlier than usual. For the first time on record, in 2012 a pair of the American tree sparrow (*Spizella arborea*) successfully raised two broods of five young each in the same nest. Some other songbird species, which also are not known to produce two broods in a season, actually produced a second brood in 2012. Many pairs of the hoary redpoll (*Carduelis hornemanni*) also produced double broods in 2012; however, this is common for redpolls in years with good dwarf birch seed production.

The mean nesting density of songbirds in the study area was high in 2012 with 3.77 nesting pairs/ha. In past years, the highest mean nesting densities ranged from 2.5-3.9 territories/ha. The mean distances between known nest sites of occupied songbird territories ranged from 12-30 m in 2012. Breeding populations of all songbird species in the study area were stable but fluctuated considerably over the years.

Six pairs of the spotted sandpiper (*Actitis macularia*) nested for the first time in the study area thus raising the total number of breeding shorebirds to eight species in the area. Another eight shorebird species migrated through the area. In contrast, the stilt sandpiper (*Calidris himantopus*) was completely absent for the first time ever likely because wetlands in the study area were dried

Photo: J. Obst

Semi-palmated plover on nest.

out already in early spring. Overall nesting populations of shorebirds were stable over the years despite some population fluctuations. However, a major shift from former shorebird nesting habitats located in now dried out wetlands to marshes along lake shores and islands was observed for the semipalmated sandpiper (*Calidris pusilla*), least sandpiper (*C. minutilla*), and red-necked phalarope (*Phalaropus lobatus*). This shift created some crowding of nesting shorebirds along shorelines.

Twelve of 13 known traditional territories of the yellow-billed loon (*Gavia adamsii*) were occupied in the waterfowl study area. On Daring Lake alone, four of seven nesting pairs of the yellow-billed loon successfully raised a total of five young representing the highest reproduction success observed over the years. The remaining three pairs lost their nests and eggs to storms, waves and predators. In comparison, in 2011, only one young was successfully raised on Daring Lake and not a single young was observed in 33 occupied territories in the larger yellow-billed loon survey area.

Six of seven known traditional territories of the pacific loon (*Gavia pacifica*) were re-occupied by pairs but none raised young including a pair which lost their nest to predators. The reproduction of the pacific loon was very low over the years. Six of nine known traditional territories of the red-throated loon (*Gavia stellata*) were re-occupied by pairs including two pairs successfully raising one and two young, respectively. In a third territory, a mate of a pair was killed by a bald eagle (*Haliaeetus leucocephalus*). Overall, the populations of loons were stable over the past three years after an initial decline in the years before. The egg shell remains of depredated or hatched eggs from seven loon nests were collected for analyzing mercury (Hg) concentrations for a contaminants study.

The numbers of staging and nesting ducks in the waterfowl study area appeared to be normal for the northern pintail (*Anas acuta*), green-winged teal (*Anas crecca*), common merganser (*Mergus merganser*), and red-breasted mergansers (*Mergus serrator*). The staging numbers of the long-tailed duck (*Clangula hyemalis*) were stable in 2012 but gradually declined over the years as did the number of nesting females. In contrast, the staging numbers of the greater scaup (*Aythya marila*) declined sharply from 25-120 scaup in former years to 2-12 in recent years including only four scaup observed

in 2012. The counts of the black scoter (*Melanitta nigra*) increased to 34 scoters in 2012 from the previous high of 14 scoters in 2000. For the first time in 2012, four pairs and a female of the mallard (*Anas platyrhynchos*) were present during the breeding season in the study area. A female mallard was observed with seven ducklings on Daring Lake; another female was on a nest with eggs; and a third female was suspected to be nesting.

The main preliminary conclusion of the 2012 survey is that breeding populations of most species of birds were stable over the years except for natural population fluctuations of raptors, owls, ptarmigan, shorebirds and songbirds, and irregularities in the presence and numbers of waterfowl. However, the numbers of the above mentioned species of diving ducks certainly declined over the years while dabbling ducks appear to be moving in.

LONG-TERM PLANS AND RECOMMENDATIONS:

The 2012 data on breeding birds from the study area are currently being digitized on the Daring Lake vegetation classification raising the total number of digitized nest site locations to 11,322 nest sites from 1998-2012. All data will be analyzed in the near future and published on a GNWT website to provide the results as an educational and research tool online for public and scientific use. This project is currently in planning and looking for funding.

The primary investigator of this project recommends that the bird surveys at Daring Lake should be continued in the coming years to monitor the breeding densities, habitats and population trends of tundra birds because considerable changes in the bird species diversity, abundance and composition are expected in the near future due to climate change and alterations in vegetation growth and habitats.

COMMUNITY INVOLVEMENT

Any comments or recommendations from communities will be addressed in the final report and during future bird surveys. The final report will be sent to all communities and stakeholders. The report is expected to be completed before March 31, 2013.

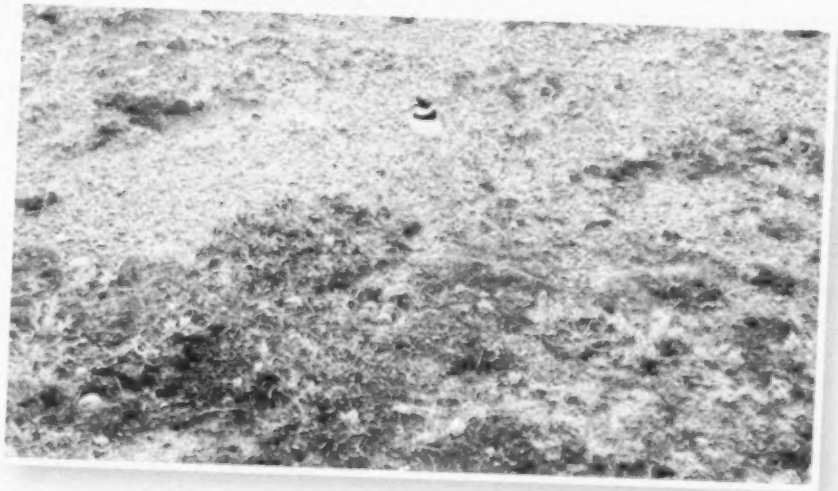

Photo: J. Obst

Semi-palmated plover near its nest.

Gull Surveys on Frame Lake, Yellowknife

May 2012 to August 2012

MAIN INVESTIGATOR:

Myra Robertson, Waterfowl Population Biologist for the Western Arctic, Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL500069

LOCATION:

Frame Lake within the City of Yellowknife, NWT.

PARTNER:

- Canadian Wildlife Service

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RATIONALE:

Gulls are present within the city of Yellowknife throughout the summer. In addition to scavenging for food at the nearby dump, they commonly scavenge for garbage and loaf in the downtown area. The city is trying to reduce numbers of gulls at the dump because of concerns with bird-aircraft collisions at the nearby airport.

A gull colony recently has established on two islands on Frame Lake, located in the center of Yellowknife. It is unclear whether the presence of this colony has or will lead to an increase in human-gull interactions. Information on gull use of Frame Lake could help in the development of mitigation measures to reduce gull-human interactions, should such measures be required in the future.

OBJECTIVES:

- To gather basic information on the species, numbers, and timing of gulls breeding on Frame Lake during 2012 with specific focus on two islands in the southern part of Frame Lake where gulls had nested in previous years.

METHODS:

The two islands in the southern part of Frame Lake were monitored from the shoreline three times/week during the breeding season. A spotting scope and binoculars were used to identify and count birds. Each island was surveyed from multiple view points along the shoreline to ensure maximum coverage. On June 19, the islands were accessed by canoe and a ground survey was done to confirm the locations of nests and count eggs.

RESULTS AND MAIN CONCLUSIONS:

Up to 175 ring-billed gulls were observed in early May at the two islands in the southern part of Frame Lake. Some of these gulls were exhibiting pairing and nesting behaviour. However, from May 11 until the end of May,

Photo: Environment Canada

A mew gull nest surveyed by canoe on Frame Lake.

the ring-billed gulls were observed flying in groups or loafing. A fox was observed on one of the islands in May when ice was still covering the lake. It is possible that the fox may have resulted in the ring-billed gulls abandoning their nests. Only one ring-billed gull nest was later observed on the islands in June; this nest successfully hatched chicks. Nineteen mew gull and two herring gull nests were present on the islands. These nests were started in late May and early June. Almost all of these nests successfully hatched at least one chick, with some hatching two or three chicks. Chicks were observed at the end of June, with most chicks having left the islands by late July. Terns, Bonaparte gulls, and ducks also nested on the islands.

On August 12, a flock of 19 ring-billed gulls with 31 chicks was observed on the northeastern part of Frame Lake. It not known where these gulls nested, or whether these gulls were the same birds that had initially started to nest on the islands in the southern part of Frame Lake and then moved elsewhere.

A more detailed report outlining the results from the 2012 surveys is available from Canadian Wildlife Service (CWS), upon request.

LONG-TERM PLANS AND RECOMMENDATIONS:

Gulls nesting on Frame Lake will be monitored in future years, as opportunity and funding permit.

COMMUNITY INVOLVEMENT:

CWS in Yellowknife hires local summer students with backgrounds in biology or renewable resources to assist in the field and office. Joshua Sullivan, a summer student with CWS, collected the data and compiled the results for the gull surveys.

We thank Velma Sterenberg, a local Yellowknife resident, for sharing her observations of gulls and other wildlife in the Frame Lake area.

Whooping Crane Ecology and Rehabilitation

May 1, 2012 to November 30, 2012

MAIN INVESTIGATOR:

Mark Bidwell, Species at Risk Biologist, Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL500051

LOCATION:

The study was conducted in and around Wood Buffalo National Park (WBNP), within a 200 km radius centered at 60° 10'N, 113° 20'W. Field operations occurred May 18-22 and July 28 to August 1, 2012.

PARTNERS:

- Crane Trust
- Platte River Recovery Implementation Program
- International Crane Foundation
- Parks Canada
- Gulf Coast Bird Observatory
- United States Fish and Wildlife Service
- United States Geological Survey

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RATIONALE:

The goal of the whooping crane recovery plan is to protect, restore, and manage whooping cranes to be self-sustaining in the wild and to down list the species' status under the *Species at Risk Act* from Endangered to Threatened. A key component to the recovery of whooping cranes is monitoring of their breeding grounds in and around WBNP. Currently, there are fewer than 300 individuals in the population, which allows us to closely monitor breeding pairs and to collect substantial information on whooping crane population demographics. This is achieved by annual aerial breeding pair surveys, nest checks, and fledging (chick survival) surveys from May to August. Whooping crane aerial surveys over their summer range have taken place annually since 1966.

In addition to breeding population monitoring, a three year project to band juvenile whooping cranes to attach satellite GPS transmitters continued in 2012. One of several recovery strategies outlined in the whooping crane recovery plan calls for the protection and enhancement of the breeding, migration, and wintering habitat for the Aransas-Wood Buffalo population. Recovery actions should continue to reduce existing threats (habitat loss and degradation, disease, mortality from power lines, loss of genetic diversity). The most serious current threat to whooping cranes is mortality that occurs during migration. Efforts to reduce this threat throughout the migration corridor, as outlined in the recovery plan, cannot be accomplished without better data and information as to the causes, location, and conditions under which whooping crane mortality occurs on migration. This project is intended to gain a greater understanding of whooping crane migration behaviour and in particular identify the potential causes and locations where mortality may occur. Information generated by this study will help us

Photo: Mark Bidwell, Canadian Wildlife Service

Whooping crane captured and leg banded with a transmitter

in developing and implementing activities that attempt to reduce threats and ultimately influence levels of mortality during migration.

OBJECTIVES:

- Population Monitoring: to monitor and understand the breeding ecology of whooping cranes in WBNP and the surrounding area.
- Three-year banding program: to gain a better understanding of whooping crane ecology and behaviour during the annual cycle with the use of GPS and radio-telemetry technology. Specifically we want to: a) gain a better understanding of stopover areas, habitat use patterns, and factors influencing habitat use at different spatial and temporal scales, b) define a current migratory route to compare to previous route models and determine environmental and anthropogenic factors that influence migratory behavior, c) identify causes, locations, and conditions of actual or potential mortality, and, d) expand current knowledge of winter and breeding ground use through high resolution GPS technology.

METHODS:

Aerial surveys were conducted over the whooping crane summer range in and around WBNP. Breeding pair surveys occurred May 18-22 to identify locations of breeding cranes and nests (and to document clutch size), to record non-nesting territorial pairs, and to document the breeding status of marked birds. Surveys to document whooping crane fledging success were conducted July 28-30; these surveys provide information on juvenile mortality rates between nesting and fledge and afford an estimate of number of juvenile cranes expected during fall migration.

Activities to capture and band juvenile whooping cranes occurred July 28-30 (aerial reconnaissance to

identify individuals suitable for capture) and July 31 to August 1 (capture and continued reconnaissance). During capture attempts, the helicopter circled to find a suitable landing spot to position the capture crew on the ground (typically 200-300 m from the family group). With the ground crew in place, the helicopter positioned itself with the crane family directly between it and the capture crew, moving as necessary to provide an aerial target to guide the ground crew's movement towards the chick to be captured (family groups are often not visible through dense, tall vegetation). Radio contact between the helicopter and the ground crew facilitated coordination during capture attempts. Upon capture (by hand or with the aid of a dip net), cranes were banded and fixed with a satellite transmitter. Blood, feather, and cloacal swab samples were acquired and basic biometric measurements were taken (to minimize handling time, measures were limited to tarsus length and weight). Finally, a veterinarian performed a general assessment of the health of each bird before it was released.

RESULTS AND MAIN CONCLUSIONS:

During breeding pair surveys, observers recorded 67 pairs of whooping cranes; 66 of these had nests. The number of nests detected in 2012 represents the third highest count on record. In addition to nests detected during surveys, three lone birds displaying territorial behaviour were observed but nests were not located for these birds; local precipitation required the pilot to fly lower than 1,000 ft. AGL causing these cranes to flush before we detected the nests. A single non-nesting territorial pair was observed, suggesting potential for further population expansion in coming years. Five nests were found outside of WBNP; two in the Lobstick Creek area, and three north of the Nyarling River. Five new nesting territories were identified this year, all within Park boundaries.

Fledging surveys detected 35 fledged young in 31 family groups (two families included twins). Fledging success, calculated as the number of observed nests divided by the number of observed fledged young, was 0.53, slightly higher the 20-year average of 0.48. However, smoke from extensive fires during fledging surveys made it difficult or impossible to access several territories in which nests were detected earlier in the year; thus, actual fledging success may have been higher than this estimate if additional chicks fledged and were not detected due to the presence of fires.

On July 31 and August 1, 10 fledged whooping crane chicks were captured in 11 attempts with an average handling time (i.e. from capture to release) of 13 minutes. As of November 2012, 31 juvenile whooping cranes had been banded in WBNP as part of this current marking effort, while 13 adults and one juvenile were banded on the wintering grounds in Texas. Since the beginning of the project, four satellite transmitters have failed and 12 birds have died or are suspected to have died. During 2012 fall migration, 30 transmitters provided information (includes two transmitters that have since failed).

LONG-TERM PLANS AND RECOMMENDATIONS:

It is rare in wildlife ecology to be able to monitor an entire population and track several individuals for extended periods. Due to the small size of the Aransas-Wood Buffalo whooping crane population, the birds' size and colour, and their high degree of territoriality, it has been possible to monitor this population with great detail, tracking both the population as a whole and attributes of individual birds. Data collected through this long term research has provided vast insight into the population's growth and obstacles to its recovery.

Despite the Aransas-Wood Buffalo population's average annual growth of 4%, reaching the recovery goal of 1,000 wild whooping cranes is many years away. The long-term plan for this project is the continued monitoring of the breeding effort and productivity. Future research aims to relate these factors to external components (specifically, habitat conditions and quality); this will be necessary to forecast future population expansion on the breeding grounds and provide insights into potential future impacts (e.g. those related to climate change).

COMMUNITY INVOLVEMENT:

The following communities and councils were consulted: Salt River First Nation, Fort Smith Métis Council, Smith's Landing First Nation, Hay River Métis Council, Kátł'odeechee First Nation, West Point First Nation, Fort Resolution Métis Council, and Deninu Kué First Nation.

We received recommendation forms from the Fort Resolution Métis Council and Salt River First Nation supporting this research. When we spoke to communities that did not return the recommendation forms, no issues or concerns relating to this project were voiced.

Arctic Island Caribou and Muskox Population Survey

July 2012 to August 2012

MAIN INVESTIGATOR:

Tracy Davisor , Regional Biologist, Environment and Natural Resources, GNWT, Inuvik Region and Judy Williams, Wildlife Technician, Environment and Natural Resources, GNWT

WILDLIFE RESEARCH PERMIT NUMBER:

WL005415

LOCATION:

Surveys were conducted on Melville, Prince Patrick, Byam Martin, Eglinton, and Emerald Islands.

PARTNERS:

- Environment and Natural Resources
- Inuvialuit Wildlife Studies Funds
- Polar Continental Shelf Program
- World Wildlife Fund

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RATIONALE:

Peary caribou are classified as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) based on overall declines of 72% since 1961. The last population survey on Banks and NW Victoria Island was conducted in 2005. The last survey on Melville and Prince Patrick Islands was in 1997. This survey provides population estimates that allow assessment of the status and recovery of the species.

OBJECTIVES:

- To update the population estimate for Peary caribou and muskoxen. The last survey to estimate the population size for this region was conducted in 1997 (Gunn and Dragon 2002).

METHODS:

A strip transect aerial survey was flown using a Helio-Courier fixed wing aircraft. Survey lines were spaced 5 km apart. Observers were seated on each side of the aircraft and observations within a 500 m strip on each side of the aircraft were considered on transect. Observations beyond 500 m were considered off transect. Caribou were classified as bulls, adults (cows/young bulls), or calves. Muskoxen were classified as adults or calves. All other wildlife sightings were recorded. Population estimates for each species were calculated using adult observations only.

RESULTS AND MAIN CONCLUSIONS:

The population estimate for non-calf caribou on Melville Island was 2,990±647 (95% confident interval), and non-calf muskoxen was 3,033±852. The population estimate for non-calf caribou on Prince Patrick Island was 2,649±85, and non-calf muskoxen was 507±320. The population estimate for non-calf caribou on Byam Martin Island was 119±114 with no muskoxen observed. The population estimate for non-calf caribou on Eglinton

Island was 181±143, and non-calf muskoxen was 213±211. The population estimate for non-calf caribou on Emerald Island was 61±118 with no muskoxen observed.

Overall the population estimates for Peary caribou and muskox are higher than the 1997 surveys.

LONG-TERM PLANS AND RECOMMENDATIONS:

The results are positive, however since the interval between surveys has been so long, current population trend cannot be determine. It is recommended that surveys are done at shorter intervals.

COMMUNITY INVOLVEMENT:

A field assistant from Sachs Harbour participated in the survey.

Herd of muskoxen

Photo: GNWT/D. Dowsley, ENR

Caribou Sampling Initiative: Caribou Body Condition and Health Monitoring

April 2011 to March 2012

MAIN INVESTIGATOR:

Tracy Davison, Regional Biologist, Environment and Natural Resources, GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL007423

LOCATION:

Inuvik Region, NWT.

PARTNERS:

- Gwich'in Renewable Resources Board
- Inuvialuit Final Agreement Implementation Fund

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RATIONALE:

This project will use specific samples from hunter-killed caribou to track the general body condition of barren-ground caribou. This project is based on a simple body condition monitoring system developed by CARMA (CircumArctic Rangifer Monitoring and Assessment Network) that can be used by hunters across the north on any caribou herd. We will use the information provided by the hunters and our lab results to document the general pattern of fatness that season, and to record trends over time.

OBJECTIVES:

- To monitor the estimated body weight, body fat and body protein of adult cow caribou over the winter and monitor trends over time;
- To monitor selected fat depots of adult bull caribou over the winter to document trends over time;
- To compare body condition to other herds being monitored using the same standardized system across the north;
- To monitor levels of heavy metal contaminants in submitted caribou kidney samples; and
- In the future the relationship of these trends to other indicators, such as pregnancy rate, calf survival, herd size, timing of spring thaw, fall storm patterns, and winter range snow depth will be investigated.

METHODS:

Kits are made available to hunters through local Renewable Resources Councils, Hunters and Trappers Committees and Environment and Natural Resources offices. Tags for the hunter to record hunter name, community, herd, date, location, sex, reproductive/lactational status, hunter assessment of condition, and depth of back fat using a ruler are printed right on the tag. Once received, we record the four standard

mandible measurements, assign an age class, determine the age of the caribou using teeth cementum, and extract and measure the marrow fat from leg bone. Blood samples will be analyzed for a standard set of diseases.

RESULTS AND MAIN CONCLUSIONS:

Twelve Porcupine caribou (two female and ten male) samples and four Bluenose-West caribou (three female and one male) samples were collected.

LONG-TERM PLANS AND RECOMMENDATIONS:

This is an ongoing project and we are working with communities to increase the number of samples submitted.

COMMUNITY INVOLVEMENT:

Hunters provided samples and information making them an essential part of this study.

Photo: GNWT/J. Adamczewski, ENR

Measuring caribou back fat.

Photo: GNWT/J. Adamczewski, ENR

Taking a DNA sample from a caribou

Late Winter Recruitment of the Tuktoyaktuk Peninsula, Cape Bathurst, and Bluenose-West Barren-ground Caribou Herds

April 2012

MAIN INVESTIGATOR:

Tracy Davison, Regional Biologist, Environment and Natural Resources, GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL007424

LOCATION:

Late winter range of the Tuktoyaktuk Peninsula, Cape Bathurst, and Bluenose-West barren-ground caribou herds.

PARTNERS:

- Inuvialuit Final Agreement Implementation Fund
- Environment and Natural Resources

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RATIONALE:

Late winter (March-April) recruitment surveys provide estimates of the number of calf caribou that will enter the adult (one-year and older) population each year. Recruitment estimates are one of the key means for determining future growth potential of a caribou population.

OBJECTIVES:

- To obtain a current estimate of late winter recruitment for the Tuktoyaktuk Peninsula, Cape Bathurst, and Bluenose-West barren-ground caribou herds.

METHODS:

GPS collar locations were used to plan flights. Portions of the winter range of the Tuktoyaktuk Peninsula and Cape Bathurst herd were flown on April 12 and 13, 2012. A total of 8.9 hrs with a Bell 206L3 were flown during the survey. No flights for Bluenose-West were conducted from the Inuvik Region; they were conducted by the Sahtu and reported separately.

All groups of caribou seen were classified. As groups were small, classification was done from the air by flying a single pass over the caribou. Each caribou was classified as a cow, calf, or bull (young or mature). Classification was based on size, presence/absence and size/configuration of antlers, and sex-organs (presence/absence of vulva patch, and penis sheath).

RESULTS AND MAIN CONCLUSIONS:

The number of calves per 100 cows was 47.4±2.8 (Standard Error) for the Cape Bathurst herd, and 52.4±4.6 for the Tuktoyaktuk Peninsula herd. These recruitment rates were not significantly different from 2010 for the Cape Bathurst herd (48.2±3.0 in 2010). However, the Tuktoyaktuk Peninsula herd had a slightly higher rate than 2010 (46.6±2.3 in 2010).

Our observations in 2008-2011 suggest consecutive years of good recruitment into these herds following relatively poor recruitment in 2007. Current recruitment rates are closer to ratios observed during the 1980s when the population was increasing.

LONG-TERM PLANS AND RECOMMENDATIONS:

The monitoring of these barren-ground caribou herds will continue with recruitment surveys generally done in years when there isn't a population estimate.

Cow:calf ratios can be impacted by the harvesting of females. If a large proportion of cows are harvested and the calves are not, then the number of calves per 100 cows left in the herd will be inflated and be an inaccurate reflection of the calf survival. Good harvest data is needed along with recruitment data to better assess the status of the herd.

COMMUNITY INVOLVEMENT:

A local assistant was hired to help conduct the survey.

Collared Cape Bathurst caribou

Photo: GNWT, Dawson, ENR

Radio Collar Deployment and a Post-calving Survey to Estimate the Number of Caribou in the Bluenose-West Herd in 2012

February 2012 to August 2012

MAIN INVESTIGATOR:

Tracy Davison, Regional Biologist, Environment and Natural Resources, GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500009

LOCATION:

Late winter and calving/post-calving ranges of the Bluenose-West barren-ground caribou herd.

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RATIONALE:

Satellite and GPS-tracked radio collars have been deployed on Bluenose-West caribou since 1995. Non-satellite tracked collars (VHF collars), which can only be located from aircraft in the vicinity of collared animals, have been deployed since the early 1980s. These VHF transmitter only collars provide much less information and their use has been discontinued for the Bluenose-West herd. All satellite and GPS collars also have VHF transmitters.

OBJECTIVES:

- To deploy 40 satellite tracked and 20 GPS tracked radio collars on 60 adult caribou from the Bluenose-West herd on the late winter range. It is anticipated that 25-35% of collars will be deployed on bulls and the remainder on cows;
- To obtain an accurate and precise estimate of herd size using aerial photographic survey on the post-calving range; and
- To monitor movements and range use by remote tracking of satellite and GPS collars throughout the year.

METHODS:

Fixed-wing reconnaissance flights will be flown starting in early March. Flight lines will be planned based on local knowledge, collar locations and the historical range of the herd. Lines will be spaced approximately 20 km apart. Location and approximate size and sex/age composition of all caribou groups will be recorded.

Once the reconnaissance survey is complete, a helicopter capture crew consisting of an experienced net gunner, handler, and pilot will be used for the capture operations during the remainder of March. An A-Star helicopter is planned to be used which will decrease caribou handling and ferry times.

The handler will identify candidate groups for collaring and ensure capture and handling times are minimized - the targets are less than one minute of pursuit and less than ten minutes total handling. All caribou will be captured by net-gun and no chemical immobilizing agents will be used.

Collars on bulls will be fitted loosely to allow for increases in neck size during the rut. All collars are manufactured with a programmed mechanism that will open and release the collar approximately 3.5 years after deployment.

Caribou condition will be assessed by body fat. Age will be estimated from incisor wear and a photograph of the incisors taken. A blood sample (about 40 ml) will be taken for genetic and disease testing, as well as pregnancy for captured cows. A fecal sample (about 50 g) will be collected for diet and parasite analysis.

In the event that a caribou is injured during capture, the extent of the injuries will be assessed. A broken antler will be re-cut with a small hand saw to smooth the broken edge. Broken bones generally require the animal to be euthanized with a shotgun carried on board the helicopter. The animal will then be skinned and butchered. Where feasible, the meat will be taken to the nearest community for distribution.

RESULTS AND MAIN CONCLUSIONS:

Between March 3-28, a total of 105 collars (95 Telonics International Inc. and 10 Lotek wireless) were deployed on adult caribou in the Tuktoyaktuk Peninsula, Cape Bathurst and Bluenose-West barren-ground caribou herds. Collars were deployed in the known winter ranges of the herds, with 46 collars (37 cows, 9 bulls) deployed on Tuktoyaktuk Peninsula and Cape Bathurst animals, and 59 collars (42 cows, 17 bulls) deployed on Bluenose-West caribou.

The post calving ground survey was conducted in July. Population estimate for the Bluenose-West herd is 20,465 (95% CI of 3,489.7); this is not significantly different than the 2009 estimate. Population estimate for the Cape Bathurst herd is 2,427 (no CI due to all collars photographed), this is statistically significantly higher than the 2009 estimate. Population estimate for the Tuktoyaktuk Peninsula herd is 2,192 (95% CI of 178.1), this is statistically significantly lower than the 2009 estimate.

LONG-TERM PLANS AND RECOMMENDATIONS:

These herds will continue to be monitored. The Gwich'in Renewable Resources Board, Sahtu Renewable Resources Board, Nunavut Wildlife Management Board, Tuktut Nogait National Park Management Board, Kitikmeot Region Wildlife Board, and the Wildlife Management Advisory Council (NWT) along with the Department of Environment and Natural Resources, Government of Nunavut and Parks Canada, are currently working on a management plan that include these herds. The current draft suggests population estimates every three to five years depending on herd status.

Photo: GNWT/J. Adamczewski, ENR

Surveying for caribou

Dehcho Boreal Caribou Collar Deployment

April 1, 2011 to March 31, 2012

MAIN INVESTIGATOR:

Nic Larter, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, Dehcho Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005037

LOCATION:

This is an ongoing study, initiated in March 2004, that has increased in size and scope to include the traditional areas of eight Dehcho First Nations and includes that area of the Dehcho Region east of the Mackenzie Mountains. The study area is adjacent to the North and South Cameron Hills study areas where female boreal caribou have been collared in the South Slave Environment and Natural Resources (ENR) region. Sixteen collars deployed under this permit were deployed within the study area. The majority of the collars deployed were newly purchased GPS units with the capability of providing location data for up to five calving periods.

PARTNERS:

- Environment Canada provided funding assistance.
- Sambaa K'e Dene Band, Liidlii Kue First Nation, Fort Simpson Métis Local, Jean Marie River First Nation, Pehdzeh Ki First Nation, Nahanni Butte Dene Band, Acho Dene Koe Band and Ka'a'gee Tu First Nation.

RATIONALE:

To ensure informed land use decisions are made in regard to the maintenance of boreal caribou populations in the Dehcho, radio collars were deployed on female boreal caribou starting in March 2004.

A combination of satellite, GPS and VHF collars have been deployed on female boreal caribou to document seasonal range use, seasonal movements, detailed daily movements, and fidelity to calving areas of female caribou over multiple years in areas of boreal caribou range which have had limited to moderate fire and seismic disturbances. Collars and the annual spring classification survey provide estimates of calf and adult female survival as well as calf production which provide annual estimates of the rate of population change.

These data will be used to monitor the population and to determine habitat use and habitat requirements, assist in the delineation of secure and critical habitat, and to assess impacts of potential resource development. More specific details are available in the annual Dehcho Boreal Caribou Progress Report, April 2011 (www.enr.gov.nt.ca/_live/documents/content/ProgRep7_Dehcho_Boreal_Caribou_Study_March11_v2.1.pdf).

OBJECTIVES:

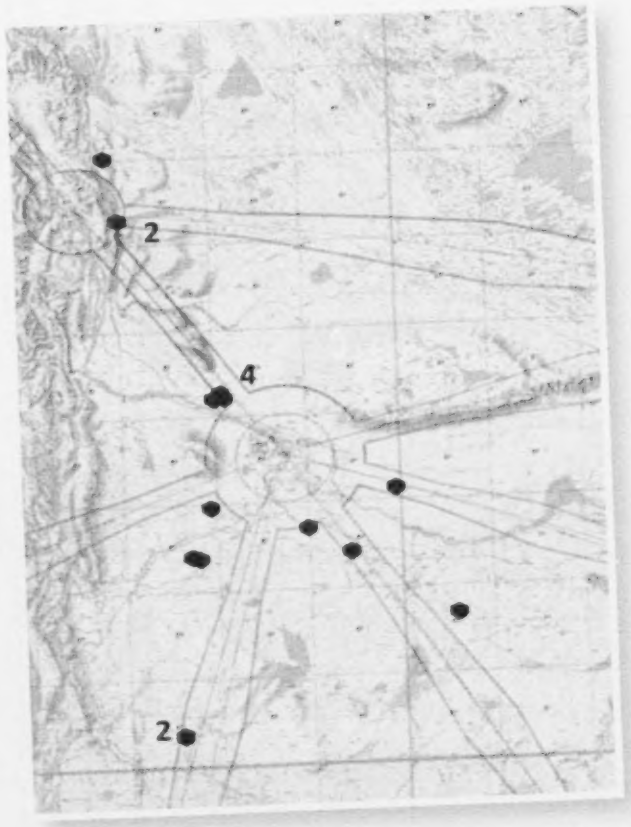
- To monitor annual calf production, calf survival, and adult survival in order to make annual estimates of the rate of population change;
- To ensure that the distribution of collared boreal caribou covers key areas throughout the range of boreal caribou in the Dehcho region;
- To determine the calving period and the degree of fidelity of female caribou to calving areas over multiple years in areas with a range of seismic and fire disturbance history;
- To use location data of female boreal caribou over multiple years overlaid with the current human

footprint and wildfires to determine areas of high use and areas of avoidance by female boreal caribou in the landscape, and whether there is a seasonal component;

- To provide empirical data to determine areas of secure boreal caribou habitat, given the current human footprint, and to compare this to the predictions and robustness of the study completed to predict high value boreal caribou habitats in the Dehcho;
- To provide current knowledge of boreal caribou ecology for use with evaluating land use applications made in the Dehcho;
- To provide empirical data for RSF modeling to assist with assessing important habitat types/ areas;
- As development occurs, to be able to assess responses of female caribou in relation to their use of space in the landscape; and
- To continue to document and assess disease and parasites in boreal caribou.

METHODS:

- Adult female caribou were live captured by a professional net-gunning team using techniques that have been approved by the ENR Wildlife Care Committee and used in previous collar deployments. The net is fired by a gunner in the helicopter and captures the caribou.
- Blood, hair and fecal samples, a neck girth measurement and photos of the teeth were collected from each female caribou as long as the opportunity was provided.
- A more detailed methodology and description of the collars and their duty cycles can be found in the Dehcho Boreal Caribou Progress Report, April 2009.



Final deployment locations of collars on boreal caribou

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RESULTS AND MAIN CONCLUSIONS:

Collars were deployed successfully on 16 female boreal caribou throughout the Dehcho Region; eight on females north of the Mackenzie River and eight on females south of the Mackenzie River. We deployed two satellite collars and 14 GPS collars of which 12 GPS collars were latest Generation 4 collars (Telonics). All collars are equipped with release mechanisms and will release in summer 2016.

LONG-TERM PLANS AND RECOMMENDATIONS:

Monitoring of collared caribou will continue through the life of the collars that have currently been deployed to better refine local and landscape seasonal patterns of use over extended periods of time. Detailed analyses are currently being conducted with results to be used for environmental assessments of land use activities among other things. An annual report of the program is being prepared. Additional collars are to be deployed to ensure that there are at least 30 functioning collars on female boreal caribou annually.

COMMUNITY INVOLVEMENT:

The eight local First Nation partners provided information on where they would like caribou collared and indicated that animals currently collared be used for locating other caribou to capture for collar deployment.

The program had been reviewed and critiqued by First Nations delegates at the 5th Biennial Dehcho Regional Wildlife Workshop in October 2010. There was consensus that a minimum of eight collars would be deployed on female caribou in February 2012; one in each First Nation partner's traditional area.

Photo: GNWT/J. Nagy, ENR

Boreal Caribou Monitoring – Hay River Lowlands (Ka'a'gee Tu Candidate Protected Area) and Cameron Hills

2011 to 2012

MAIN INVESTIGATOR:

Allicia Kelly, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBERS:

WL004819 (April 2011 to March 2012) and WL500045 (May 2012 to Dec 2012)

LOCATION:

The combined study area (Hay River Lowlands and Cameron Hills) is bounded by Hay River to the east, the Mackenzie River and Great Slave Lake to the north, the Redknife and Kakisa Rivers to the west and the Hay River to the south.

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RATIONALE:

Boreal caribou monitoring is required to determine if these ranges are providing sustainable habitat for boreal caribou, to understand how boreal caribou respond to development, climate change and other pressures, and to make effective management decisions that will conserve boreal caribou for future generations. This study has been ongoing since 2003 and has provided valuable information on boreal caribou population demographics, condition, and habitat selection in South Slave Region.

OBJECTIVES:

- To monitor population demographics: adult female survival, calf production, ten-month calf recruitment, and finite rate of population increase (the relative change in size of population from one year to the next);
- To document seasonal range use, annual home ranges and fidelity to calving areas (whether cows use the same area to calve year after year); and
- To examine boreal caribou habitat use and selection in relation to natural and human caused disturbance (e.g. wildfire, development) and landscape features (e.g. forest type).

METHODS:

Monitoring was very limited in 2011-12 due to very few collared cows in the study area and postponed funding. GPS collars are programmed to collect three locations per day, 365 days/year.

A recruitment survey was not conducted in March 2012 because there were too few collars to assist with locating groups of caribou to classify, and to calculate cow survival (needed to calculate lambda and population trend).

RESULTS AND MAIN CONCLUSIONS:

As of April 1, 2011, in the Hay River Lowlands study area, there were two active GPS collars and six active VHF collars. The two GPS collars released in July 2011 and were retrieved in August 2011.

As of February 2011, four of the six VHF collared caribou were still alive. Three of the remaining VHF collars were scheduled to drop in June 2012 and one is scheduled to drop in April 2013.

As of April 1, 2011, in the Cameron Hills area, there were two active GPS collars managed by NWT. Both collars released in July 2011 and were retrieved in August 2011.

LONG-TERM PLANS AND RECOMMENDATIONS:

Future monitoring will focus on boreal caribou habitat north of the Cameron Hills. We recommend that monitoring of boreal caribou continue with a minimum of 25 collared cows in the study area. Caribou movement and location data also provides valuable data on how caribou use the habitat available to them. Meetings will be held with partners to discuss additional program priorities and share information.

COMMUNITY INVOLVEMENT:

Local observers are used when possible for surveys. Results are shared and discussed at community based meetings including the biennial Regional Wildlife Workshops.

Contaminants in Mink (South Slave Region)

April 2011 to March 2012

MAIN INVESTIGATOR:

Allicia Kelly, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL004818

LOCATION:

The Slave River and Cameron River/Tathlina Lake riverine ecosystems. Samples will be taken near the communities of Fort Smith and Kakisa.

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RATIONALE:

The Slave River and its aquatic environment provides habitat for a range of wildlife species including fish and furbearers like mink. With increasing development in Alberta and British Columbia, communities along the Slave River drainage are concerned about water quality issues from upstream industrial activities such as oil sands development, oil and gas and pulp mills, and their potential effects on wildlife that depend on this river system.

Mink (*Mustela vison*) eat mostly fish and small animals and are at the top of the food chain. They can have higher levels of environmental contaminants in their bodies than animals that are lower on the food chain. As well, because mink eat both fish and small land animals such as mice, they are exposed to contaminants from both the land and the water. Mink are particularly sensitive to contaminants called organochlorines (OC). These contaminants can be found in pesticides, fire retardants, and industrial waste. When mink have even low levels of these pollutants in their bodies it can be hard for them to reproduce. This unique sensitivity can mean that there will be less mink in the area even with low levels of environmental contaminants.

Because mink are sensitive to environmental contaminants they can tell us about the overall health of the ecosystem. Monitoring mink in the ecosystem can help us learn about changes in levels of contaminants that come from industry and agriculture, changes in the Slave River system, and/or environmental change. This project will provide an update on current levels of metal and OCs in mink and several of their main diet species.

OBJECTIVES:

- To examine levels of metals and contaminants in mink along the Slave River and at a control site near Kakisa, and compare to levels documented in the same area almost 20 years previously;

- To examine levels of contaminants in several key prey species, including muskrat, snowshoe hare and northern red-backed vole, and ensure safe levels of subsistence species (muskrat and hares); and
- To look at patterns of contaminant input and accumulation in mink through a combination of existing data from water, sediment, plankton, amphipods and other prey species including fish along the Slave River.

METHODS:

Sample collection will be done by local hunters and trappers as part of their regular harvesting activities (mink, snowshoe hare, muskrat), and as part of the ongoing NWT-wide small mammal study conducted by Environment and Natural Resources (ENR) (northern red-backed vole). ENR staff will provide training and sample kits, collect carcasses and field information for each animal and compensate hunters and trappers financially for each complete carcass and data kit. In Kakisa, sampling will be done in conjunction with their local integrated community-based monitoring program.

A suite of metals including mercury and OC compounds including PCBs will be assessed in mink along the Slave River. The project will also examine concentrations of contaminants in several key diet species including snowshoe hare, northern red-backed vole, and muskrat from the same study area. A total of 20 mink (ten male and ten female) from the Slave River system will be selected randomly for contaminant analysis. For the other three prey species, three pools per species (five animals per pool) each of red-back voles, snowshoe hares and muskrat will be tested from a distant control site (Cameron River/ Tathlina Lake near Kakisa).

Data collected for each animal will include collection date, location and description of the habitat where collected. Carcasses will be processed at the ENR Fort Smith laboratory, where the sex, weight and body condition indices will be recorded. Stomach content analysis will be conducted for each mink carcass to determine the prey species consumed. Age will be determined from tooth cementum analysis of a lower canine (done by Matson's Laboratory, Milltown, MT). Stable isotope analyses ($\delta^{13}C$ and $\delta^{15}N$) will also be conducted to characterize the trophic relationships in the food web. Liver, kidney and fat (inguinal pad) samples will be collected from a random selection of the mink carcasses. Paired samples will be collected for OC and metal analysis; OC samples will be collected in solvent-cleaned foil in individual Whirlpak polyethylene bags, and samples for metal analysis will be collected in individual Whirlpak polyethylene bags. Liver samples will be used for current contaminant analysis, and other samples will be banked for future use.

For the prey species (snowshoe hare, muskrat and northern red-backed voles), carcasses will also be processed at the Fort Smith ENR laboratory where similar information on age, sex, body condition and date/location of collection will be collected. Liver and kidney samples will be collected as described above for mink. Liver samples will be used for current contaminant analysis, and other samples will be banked for future use. Samples will be stored at -20°C until they are forwarded for contaminant analysis. Each sample/pool will be tested for a suite of metals including total mercury, and a suite of organochlorine compounds including PCBs, DDT, toxaphene, chlordane, dieldrin and dioxins/furans.

RESULTS AND MAIN CONCLUSIONS:

The scope of the work outlined for this permit was not carried out as the sample size was too small.

LONG-TERM PLANS AND RECOMMENDATIONS:

Recommendation to carry forward the project for future studies.

Moose Abundance in the North Slave Region

November 2012

MAIN INVESTIGATOR:

Dean Cluff, Regional Biologist, Environment and Natural Resources, GNWT, North Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500092

LOCATION:

The 2012 survey was conducted from November 19-23 in the Taiga Shield (TS) and from November 26, 28-30 in the Taiga Plains (TP) ecozones of the North Slave Region.

PARTNER:

- Environment and Natural Resources (North Slave Region, and Headquarters)

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RATIONALE:

Moose are an important resource in the NWT because they are a significant food source for hunters. Increased hunting pressure on moose is expected because of restricted hunting of barren-ground caribou and the closure of the Mackenzie bison harvest due to an extensive anthrax outbreak in summer 2012. The last survey was five years ago and a population status update was needed.

OBJECTIVES:

- To estimate the number and density of moose in the North Slave Region; and
- To estimate the bull:cow and calf:cow ratios for population monitoring.

METHODS:

Stratification was updated for both survey areas via sightings of moose since the last survey (November 2007) and aerially from November 13-15. Aircraft used were turbine Beavers (one plane for the stratification effort, and two planes for each of the TS and TP surveys). Community observers were used in both stratification and main survey efforts.

We flew 122 grid cells (about 16 km^2 each) in the TS survey and 65 grid cells in the TP survey. Grid cells are stratified as either High or Low probability of having moose. Of the 122 grid cells surveyed in the TS area, 61% (74 cells) were classified as High, and 39% (48 cells) were classified as Low. Of the 65 grid cells surveyed in the TP area, 65% (42 cells) were classified as High, and 35% (23 cells) were classified as Low. All large mammal sightings were recorded via GPS waypoints and moose were further classified by sex and age class. We used the GeoSpatial Population Estimation (GSPE) method to estimate population size and bull:cow and calf:cow ratios.

Aerial survey conducted looking for moose.

Photo GNWT/K. D. Cluff ENR

RESULTS AND MAIN CONCLUSIONS:

Taiga Shield

We observed 197 moose during the TS survey. That is up from 113 moose observed in the November 2007 survey. We were able to classify all but three of them. Therefore, we classified the 194 moose as 52 bulls (17 small, 34 large, one bull unclassified to size), 100 cows and 42 calves. These sightings resulted in a bull:cow ratio of 52 bulls:100 cows and a calf:cow ratio of 42 calves:100 cows. These observation ratios were different than the point estimates from the GSPE method estimated for the entire survey area. The bull:cow ratio was 44.7 bulls/100 cows and the calf:cow ratio was 51.4 calves/100 cows.

Of the 100 cow sightings, 65 of them were of lone cows, but 27 cows had one calf associated with them and eight cows had twins. November 2007 estimates based on the sightings only (n=112 classified moose) were 77 bulls:100 cows and 77 calves:100 cows. The GSPE point estimates for 2007 were 67.5 bulls:100 cows, and 111 calves:100 cows. Based on these comparisons, bull:cow and calf:cow ratios for moose have declined since November 2007, but more moose were observed than in 2007.

The population point estimate for November 2012 was 1,030 moose with a standard error (SE) of 205 moose. Therefore the 80% confidence interval (CI) for the TS survey area is 767 to 1,293 moose. This means that if

Photo: GNWT/H. D. Cluff, ENR

Moose walking amongst the trees.

the survey was to be repeated (i.e. at the same time and the same conditions), there would be an 80% chance that the point estimate would fall within that range. For increased certainty, the CI would have to become wider. For example, the 90% CI for the TS survey area in 2012 would be 693 to 1,367 moose, given the SE.

Using the point estimate of 1,030 moose and the survey area of 17,585 km^2, the 2012 density estimate for the TS is 5.8 moose/100 km^2, up from the 2007 survey that had a density estimate of 4.1 moose/ km^2. The number of moose estimated in March 2004 was 266 moose (SE=66 moose). The 80% CI was 182 to 350 moose (density estimate = 1.5 moose/100 km^2). However, 2004 was the first year of these surveys and no stratification reconnaissance flights were done prior to the survey and this likely influenced the analysis. The 2007 and 2012 surveys are superior because they both occurred in the fall (bulls still have their antlers) and included stratification flights prior to the actual survey.

Non-moose sightings in 2012 were one incidence of six bison, five incidences of one wolverine, five incidences of one wolf, and one snowy owl.

Taiga Plains

We observed 58 moose during the TP survey. That is down from 88 moose observed in the November 2007 survey. We were able to classify all of them. We classified the 58 moose as 20 bulls (6 small, 14 large), 26 cows and 15 calves. These sightings result in a bull:cow ratio of 77 bulls:100 cows and a calf:cow ratio of 58 calves:100 cows. The point estimates from

the GSPE method were 69.8 bulls/100 cows and 56.5 calves/100 cows.

Of the 26 cow sightings, 12 of them were of lone cows, but 13 cows had one calf associated with them and one cow had twins. This was the first survey year where we saw a cow moose with twins. We did not see twins in March 2004 or November 2007 surveys in the TP area. November 2007 estimates based on the sightings only (n=82 classified moose) were 50 bulls:100 cows and 36 calves:100 cows. The GSPE point estimates for these ratios in 2007 were 44.6 bulls/100 cows and 64.7 calves/100 cows. Based on these comparisons, the bull:cow ratio has increased and the calf:cow ratio has decreased since November 2007, and fewer moose were observed in 2012 than in 2007.

The population point estimate for November 2012 was 234 moose with a SE of 57 moose. Therefore the 80% CI for the TP survey area is 161 to 307 moose. The 90% CI for the TP survey area in 2012 is 140 to 328 moose, given the SE.

Using the point estimate of 234 moose and the survey area of 8,005 km^2, the 2012 density estimate for the TP survey area is 2.9 moose/100 km^2, down from the 2007 survey that had a density estimate of 3.2 moose/km^2. In March 2004, the survey was smaller at 6,700 km^2, the number of moose was estimated at 241±78 moose (80% CI), resulting in a density estimate of 3.6 moose/100 km^2.

Incidental non-moose sightings in 2012 were 16 incidences of bison totaling 108 individuals, three incidences of boreal caribou totaling 17 individuals. No wolverine and no wolves were sighted.

LONG-TERM PLANS AND RECOMMENDATIONS:

The next moose survey is planned for November 2015. Consideration should be given to collaring some moose to assess habitat use, movements and calf production and survival.

COMMUNITY INVOLVEMENT:

Community representatives served as observers in the planes and helped classify moose seen.

Muskoxen Abundance and Distribution Survey

April 5, 2011 to March 31, 2012

MAIN INVESTIGATOR:

Allicia Kelly, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL004817

LOCATION:

In April 2011, a muskox strip transect survey was conducted in two areas of the NWT southeast of Great Slave Lake. The first survey block was located northeast of Fort Resolution. The second survey block, Rennie Lake, was located between the NWT/Saskatchewan border north to 62° and between 107°N and the NWT/Nunavut border.

The 2011 South Slave region muskox survey was conducted in the red areas southeast of Great Slave Lake. The 2010 North Slave region muskox survey was conducted in the grey area east of Great Slave Lake (see summary report for WL005681 in the 2010 publication).

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RATIONALE:

Muskoxen populations in the central subarctic were greatly reduced by unregulated hunting prior to the establishment of the Thelon Game Sanctuary in 1927. Since then, muskoxen from the Sanctuary have been expanding into their former range and southward into the tree line. By 2004, muskoxen had been seen on the shore of Great Slave Lake near the Lockhart River. Since then, there have been multiple reports of muskoxen observations even further south such as Nonacho Lake, Deskenatlata (Descataway) Lake, Ivanhoe Lake, Kasba Lake, Rennie Lake, and Wholdaia Lake areas. In areas with consistent traditional use (e.g. Rennie Lake), this is the first time muskoxen have been seen that far south by the current trappers.

Most of the southern observations of muskox are outside areas with a muskox management zone or a muskox harvest quota. Under the federal *NWT Act*, muskox are one of four species listed as "Game Declared in Danger of Becoming Extinct", which means the GNWT is able to manage Aboriginal and non-Aboriginal harvest.

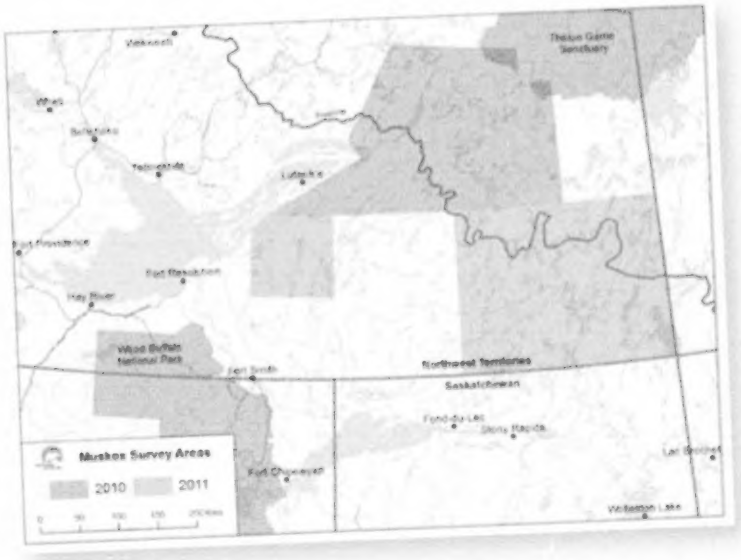
The expanding range of muskoxen could potentially create renewed interest in harvest for muskoxen. To date, there have been no surveys in this particular area to aid in developing a management plan and/or sustainable harvest quantities.

OBJECTIVES:

- To estimate the abundance and distribution of muskoxen in each of the survey blocks. This information will be used to inform management decisions related to quotas and tag allocations for muskox in the South Slave region.

METHODS:

A strip transect aerial survey was flown using a Found Bush Hawk aircraft flying 185 m AGL at 160 km/hr. Survey lines were spaced 11 km apart. Observers were seated on each side of the aircraft and 'on' transect



South Slave muskox survey areas.

observations were identified within 500 m on each side of the aircraft. Observations beyond 500 m were recorded but were considered off transect. Muskoxen, both on and off transect, were counted and photographed. All other wildlife sightings were recorded.

RESULTS AND MAIN CONCLUSIONS:

The Fort Resolution survey was flown out of Fort Resolution on April 8-9, 2011. No muskoxen were seen in this block although probable muskoxen tracks were observed.

The Rennie Lake survey block was flown on April 11 and 20-26, 2011. In total, including muskoxen on transect, off transect, and on ferry flights to and from the survey block, 164 muskoxen were seen in 14 groups. All the muskoxen seen were in the northern part of the survey block and near or above tree line.

Due to the low number of observations on this survey, it was combined with the muskox survey conducted the previous winter in the area adjacent to the north to calculate a combined population estimate. Muskox were surveyed in the North and South Slave regions in 2010 and 2011, respectively. The combined population estimate from both surveys was 2,203±863 muskox (95% confidence interval; range: 1,340-3,066 muskox)[1].

LONG-TERM PLANS AND RECOMMENDATIONS:

The Department of Environment and Natural Resources is proposing to amend the existing muskox management zone U/MX/01 to include areas where muskox have expanded their range, and to provide opportunities for sustainable muskox hunting for communities and hunters in the North and South Slave regions and northern Saskatchewan.

COMMUNITY INVOLVEMENT:

Community members from Fort Resolution Métis Nation, Deninu Kué First Nation, Łutselk'e First Nation and Black Lake First Nation (Saskatchewan) assisted as observers on this survey.

[1] Muskoxen are relatively sedentary and so movement between survey areas over one year is likely minimal (Gunn and Fournier 2000).

Small Mammal and Hare Surveys

June 2012 to August 2012

MAIN INVESTIGATOR:

Suzanne Carrière, Wildlife Biologist (Biodiversity), Environment and Natural Resources, GNWT

WILDLIFE RESEARCH PERMIT NUMBER:

WL500063

LOCATION:

Sahtu	
Norman Wells:	65° 18'N; 127° 20'W
Tulita:	64° 54'N; 125° 34'W*
North Slave	
Yellowknife:	62° 24'N; 114° 26'W
Tibbitt Lake:	62° 34'N; 113° 20'W[H]
Bliss Lake:	62° 34'N; 113° 20' W**
Gordon Lake:	63° 00'N; 113° 10'W**
Daring Lake:	65° 00'N; 111° 30'W[A]
Dehcho	
Fort Liard:	60° 39'N; 117° 29'W
Fort Simpson:	62° 00'N; 122° 00'W
Trout Lake:	60° 26'N; 121° 15'W
South Slave	
Fort Smith:	60° 01'N; 111° 54'W
Fort Resolution:	61° 10'N; 113° 40'W
Fort Providence:	61° 20'N; 117° 40'W[H]
Kakisa:	61° 00'N; 117° 20'W
Tsu Lake:	60° 35'N; 111° 53'W
Inuvialuit-Gwich'in	
Inuvik:	68° 18'N; 133° 29'W*

*Survey not performed in 2012 due to personnel unavailability.

**Survey terminated at this site.

[H]Hare survey only.

[A]Survey modified for Arctic hare.

OBJECTIVES:

- The NWT small mammal survey (SMS) monitors changes in density of voles, mice, lemmings, and shrews across five ecozones in the territory. The hare transect survey (HTS) monitors snowshoe hare density across all forested ecozones, and an abundance index for Arctic hare at the tundra site.

METHODS:

Small mammal data is collected using snap-traps or live traps and reported as the number of trapped specimens per 100 trap-nights (capture index). Monitoring is done on standardized permanent trap lines. Usually, 100 traps are out for five nights. Trap lines are checked at least each morning before 10:00 a.m. The trapping is planned for August each year, but at some sites the survey is performed in June, July or September if other activities require a change in timing.

Hare data is collected on four transects at each site. Each transect consists of 20 permanent quadrats measuring 5.1 cm x 305.0 cm oriented along the transect

Photo: GNWT/ A. Poplar, ENR

Hare transect survey area in the Sahtu region

and evenly spaced 15-30 m apart. Hare fecal pellets deposited within each quadrat are counted and cleared from the quadrat. The number of pellets per quadrat is then correlated to an estimate of hare density (number of hare/ha) at each site.

RESULTS AND MAIN CONCLUSIONS:

In summer 2012, small mammal numbers crashed after a record number in 2011 at the tundra site (Daring Lake). Numbers also declined in most other sites, except Fort Smith, Fort Resolution, Kakisa, and Fort Simpson.

Peaks in hare numbers occurred in the NWT every ten years or so, in 1962, 1971, 1980, 1990, and then in 1999-2000. Hare populations across the NWT remained low between 2002 and 2006 but increased rapidly in 2009 and may have peaked in 2010. This latest peak in numbers is not as high as in previous decades. Lower peaks are also observed in the Yukon. The hare numbers have been low to medium since 2011.

LONG-TERM PLANS AND RECOMMENDATIONS:

This survey is part of long-term efforts to monitor the natural fluctuations of small mammals and hares in both forested and tundra ecosystems in the NWT. Plans are to continue the survey and expand the number of sites with community advice. The survey will be expanded to include communities who request it.

Photo: GNWT/ D. Allaire, ENR

Hare observed in the Dehcho region

PARTNERS:

- Participating agencies and organizations in 2012 included the Department of Environment and Natural Resources (Government of the NWT), Ka'a'gee Tu First Nation, Sahtu Renewable Resources Board, Gwich'in Renewable Resources Board, and Aurora College in Fort Smith.

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The information from both hare and small mammal surveys is used in many other projects, for example to predict furbearer abundance in the NWT. Other agencies or organizations also rely on results from the SMS and HTS to complement their studies.

In 2012, survey data was shared for:
A study on the possible link between lemming/vole cycles in the Arctic and emergence of snowy owls in southern Canada. Data shared with Audrey Robillard, Université Laval.

A study titled *Synchrony in the Snowshoe Hare Cycle in Northwestern North America, 1970-2012*, submitted to the Canadian Journal of Zoology in January 2013. Data shared with Charles Krebs, University of British Columbia.

A paper titled *What Factors Determine Cyclic Amplitude in the Snowshoe Hare Cycle?*, submitted to Oecologia in March 2013. Data shared with Charles Krebs, University of British Columbia.

Ecozone evidence for key findings and for technical reports underpinning the summary report *Canadian Biodiversity: Ecosystem Status and Trends 2010*. These are available at www.biodvcanada.ca.

COMMUNITY INVOLVEMENT:

Over the years, biologists from government, co-management boards and non-profit organizations, Renewable Resources Officers, academic researchers, schools and colleges, academia, and environmental consultants all participated in data collection for both projects. At some sites, students assisted in data collection within research camps or school field courses. The success of the NWT SMS and HTS is possible because of the combined efforts of all project participants.

PARTICIPANTS:

- **Daring Lake:** Steve Matthews (ENR, GNWT, Wildlife Division) and students at Daring Lake Tundra Science Camp.
- **Fort Liard:** Floyd Bertrand (Manager Wildlife and Environment, ENR, GNWT, Dehcho Region) and Brendan Tsetso (RROII, ENR, GNWT, Dehcho Region).
- **Fort Providence:** Michelle Tuma and Chloe Smith (students, ENR, GNWT, Wildlife Division).
- **Fort Resolution:** Karl Cox (Wildlife Technician, ENR, GNWT, South Slave Region) and Kyle Beck (ENR, GNWT South Slave Region).
- **Fort Simpson:** Danny Allaire (Wildlife Technician II, ENR, GNWT, Dehcho Region) and Nic Larter (Manager Wildlife Research and Monitoring, ENR, GNWT, Dehcho Region).
- **Fort Smith:** Karl Cox (Wildlife Technician, ENR, GNWT, South Slave) and Terrance Campbell (ENR, GNWT, South Slave Region).
- **Kakisa:** Shawn Laidlaw and Melaine Simba (Ka'a'gee Tu First Nation).
- **Trout Lake:** Dave Madden and class from Charles Tetcho School, Trout Lake.
- **Tsu Lake:** Linh Nguyen, Veronica Bouvier, Twyla Tatti, Shelby Nadli, Craig Robinson, Katie White, Jordan Soroff, Laura Krutko, Jason Horesay, Kelcey Pierrot (Aurora College).
- **Norman Wells:** Richard Popko (Manager Wildlife Research and Monitoring, ENR, GNWT, Sahtu Region) and Stephanie Behrens (Wildlife Technician II, ENR, GNWT, Sahtu Region).
- **Yellowknife:** Suzanne Carrière (Wildlife Biologist (Biodiversity), ENR, GNWT), Chloe Smith, Ben Linaker, Brooke Jen, Kim Heisle, Kevin Dunkee, and Nick Hurst (summer students from various divisions in ENR, GNWT, Yellowknife) and Stephanie Yuill (Public Education Specialist, ENR, GNWT).

Wolverine Carcass Collection

April 2011 to March 2012

MAIN INVESTIGATOR:

Jodie Pongracz, Regional Biologist, Environment and Natural Resources, GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL007421

LOCATION:

Inuvik Region, NWT.

PARTNERS:

- Funding was provided through the Inuvialuit Final Agreement and Gwich'in Implementation funds.

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RATIONALE:

The wolverine (*Gulo gulo*) is a scavenger and opportunistic predator that has experienced considerable population reduction and range retraction across North America. In order to help determine if the overall harvest is sustainable, information is needed on the numbers, distribution, and composition of wolverine taken in the Inuvialuit Settlement Region and Gwich'in Settlement Area. Annual harvest data will form a better foundation from which to assess whether this level is sustainable, and to address other management issues. Carcass collections allow us to get this information and also collect additional information about the age, sex, body condition, parasite loads, reproductive parameters and diet of the animals harvested.

OBJECTIVES:

- To document the distribution and level of wolverine harvest in the Inuvik Region;
- To assess the age, sex ratios, condition, seasonal diet, and reproductive parameters of the wolverines harvested within the Inuvik region and compare to similar work in other regions of the NWT; and
- To collect genetic material for later analysis to compare wolverine populations across the NWT.

METHODS:

All local hunters are encouraged to participate in the study and are offered financial compensation to bring in each carcass/sample kit and provide information on harvest date and location. Sample kits are prepared and distributed to the Renewable Resource Officers, Hunters and Trappers Committee, and/or Renewable Resources Council in each community. These kits are provided to help hunters collect the necessary biological samples and information. Successful hunters complete the tag and hunter kill return form, and submit the samples or entire carcass from each wolverine killed.

RESULTS AND MAIN CONCLUSIONS:

In the 2011/12 season, a total of 75 wolverines were submitted to the program, comparable to the numbers submitted in previous years (range 32-77). Preliminary stomach content analyses indicate caribou as the most common prey species but many other prey were found including fish, wood/vegetation, muskrat, snowshoe hare, Arctic hare, moose, ptarmigan, vegetation, beaver, muskox, Arctic ground squirrel, red fox, vole, Arctic fox, common raven, spruce grouse, red tree squirrel, ermine, duck, goose, lemming, mink, and egg shell of goose.

LONG-TERM PLANS AND RECOMMENDATIONS:

This program is continual.

COMMUNITY INVOLVEMENT:

Hunter participation is essential to this program as they submit carcasses.

Wolf
Sample Collection

April 2011 to March 2012

MAIN INVESTIGATOR:

Jodie Pongracz, Regional Biologist, Environment and Natural Resources, GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL007422

LOCATION:

Inuvik Region, NWT.

PARTNERS:

- Funding was provided through the Inuvialuit Final Agreement and Gwich'in Implementation funds.

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RATIONALE:

In order to understand the impacts of wolves on caribou populations, the Department of Environment and Natural Resources initiated a wolf harvest-monitoring program. This was the fifth year of carcass collections from the mainland NWT, in the Inuvik Region. Carcasses are collected from harvesters of wolves on the mainland and necropsied to collect a variety of information and samples. With wolves harvested on the Arctic Islands, the program will collect: heads, fat, hair/skin, reproductive organs, and a leg bone.

OBJECTIVES:

- To document age, sex, condition and location of wolf harvests within the range of the Cape Bathurst and Bluenose-West caribou herds;
- To document pack size and incidental observations of wolves and wolf kills;
- To document diet of mainland wolves to determine what portion of the diet is caribou; and
- To archive samples to look at genetic diversity of Arctic wolves.

METHODS:

All local hunters are encouraged to participate in the study and are offered financial compensation to bring in each carcass/sample kit and provide information on harvest date and location. Sample kits are prepared and distributed to the Renewable Resource Officers, Hunters and Trappers Committee, and/or Renewable Resources Council in each community. These kits are provided to help hunters collect the necessary biological samples and information. Successful hunters complete the tag, hunter kill return form, and submit the samples or entire carcass from each wolf killed.

Photo: GNWT/R. Decker, ENR

Arctic wolf, found on Melville Island.

Photo: GNWT/ENR

Wolf killed caribou

RESULTS AND MAIN CONCLUSIONS:

In the 2011/12 season, there were a total of 58 carcasses and about 21 skulls (after April 15) submitted from the mainland. Wolves from the Arctic Islands include 32 from Ulukhaktok and 23 out of Sachs Harbour. Preliminary stomach content analyses indicate caribou as the main prey species on the mainland and muskox on the islands. Other prey includes moose, snowshoe hare, red fox, fish (bait?), wood/vegetation, Arctic hare, Arctic fox, voles, mink, mallard, muskrat, grouse, and boreal chickadee.

LONG-TERM PLANS AND RECOMMENDATIONS:

This program is continual.

COMMUNITY INVOLVEMENT:

Hunter participation is essential to this program as they submit carcasses and samples.

Aerial Wolf Den Surveys and Monitoring on the Central Tundra

2012

MAIN INVESTIGATOR:

Dean Cluff, Regional Biologist, Environment and Natural Resources, GNWT, North Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL006886

LOCATION:

The study took place on the central tundra region of the NWT and includes Aylmer and Clinton-Colden Lakes to the east, Pellatt Lake to the north, Point Lake, Greenstockings Lake and Jolly Lake to the west, and Mackay and Walmsley Lakes to the south.

PARTNERS:

- Environment and Natural Resources (North Slave Region, and Headquarters)
- Dominion Diamond Ekati Corporation
- DeBeers Canada Inc.

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RATIONALE:

Management plans prepared for barren-ground caribou herds recommend monitoring for trends in predator abundance. Population sizes of wolves are notoriously difficult to estimate because wolves range over vast areas, exist at relatively low densities, have secretive behaviour, and limit their activity during daylight hours. Wolves that follow migratory barren-ground caribou add to the difficulty by having increased annual home range sizes. Consequently, counting wolves can be a complex and costly effort easily susceptible to biases and errors. Standardized, accurate, and cost-effective methods of assessing wolf distribution and abundance are lacking and need to be identified and implemented.

Previous studies with radio collared wolves on the tundra have shown that mated pairs usually return to the same site each year. Determining den site occupancy annually over a large set of known wolf dens offers a way to monitor the population status of wolves in the Bathurst caribou herd range. A positive linear relationship is assumed such that more wolves on the landscape would result in more active den sites. Monitoring litter size of wolves estimates annual recruitment and can indicate responses of wolves to changing prey densities. Aerial surveys are useful to count pups over a wide geographical area, a necessary effort when habitat types vary and litter size fluctuates locally. Wolf pups are not normally observed during the early June aerial surveys for den occupancy because pups are small (two to three weeks old) and remain inside the den. Therefore, counts of pups prior to late August are helpful to track pup mortality over the summer and estimate recruitment. Establishing trend in the tundra wolf population helps managers assess if wolf management programs are contributing towards caribou recovery.

OBJECTIVES:

- To establish an annual relative abundance index for tundra wolves;
- To investigate wolf population response to changing caribou abundance; and
- To quantify frequency of den site usage.

METHODS:

Objective 1: Trends in wolf numbers can be monitored by tracking changes in wolf den site usage. Over 100 wolf den sites known from previous surveys are monitored each year in early to mid-June for activity. Late May or early June is an optimum time for this survey because wolves rest at the den site during the day and are easily visible. Lake ice can also support aircraft for landings and accessing fuel caches. Each den site will be assessed if active from the air with a small fixed-wing airplane (e.g. Aviat Husky). The survey area was expanded in June 2006 to cover a wider geographic area and this area is now flown each year. The survey route also optimizes flying over eskers and esker-like habitat between known den sites as a way to look for new den sites. Active den sites and survey routes are mapped to a 10x10 km grid established for the NWT for spatial analysis for wildlife management surveys. Eskers and esker-like habitat identified for each grid cell in the survey area serves as high quality habitat stratification for flying grid cells as entire grid cells (100 km^2 each) cannot be completely surveyed.

The spring survey flight allows for documenting natal or whelping den sites of wolves. A den site is considered active if wolves are observed there. If active, the number of individuals observed at each site will be noted. If only signs, such as tracks or fresh digging, are observed, then we return at another time (e.g. next day) to determine if the site is active. Revisits to sites are also necessary to quantify detection probabilities of wolves at dens.

Objective 2: Recruitment of pups into the population is a significant factor in wolf population dynamics. Consequently, to count pups an aerial survey of currently active wolf den sites is typically flown in mid- to late August with a small fixed-wing airplane. Ground observations of active den sites may be done in late summer where logistics permit to assess the accuracy of aerial counts. Ground counts can be facilitated by collaboration with other wildlife monitoring programs such as those conducted by industry. The most reliable number of wolf pups observed at each site in late summer or early fall will estimate recruitment.

Objective 3: The survey route has included den sites of unmarked and radio collared wolves in the past. Monitoring radio collared wolves has the advantage of greater certainty in finding relocated den sites and thereby a better understanding of den site fidelity. Wolves were collared in the North Slave Region in March 2012 and these wolves will be monitored for their den use and radio-tracked to assist in the pup count survey.

RESULTS AND MAIN CONCLUSIONS:

The 2012 wolf den survey was flown from May 28 to June 3 with the Aviat Husky airplane. Twenty active dens were confirmed in the 4,974 km of flying within the study area. That converts to 4.02 active wolf dens/1,000 km, an increase from 3.55 dens/1,000 km in 2011, the lowest year recorded. 4.16 active dens/1,000 km flown in 2010 were recorded. There were a few sites with suspected activity which were revisited in August. Incidental sightings of other wildlife in the survey include: one muskox, two red fox, three grizzly bears (one adult female and two two-year old cubs), one cow moose with a calf (near Winter Lake), and four sightings of caribou (one, five, six, and ten caribou).

The 2012 wolf pup survey was flown from August 23-25 also with the Aviat Husky. Few wolves were seen — only

Wolf pup survey on the tundra

Photo: GNWT/H.D. Cluff, ENR

eight adult wolves plus one pup on the tundra, and three wolves in the boreal forest area. There were 22 active wolf dens from the spring survey in late May/early June that were revisited for the pup survey. Only one of those den sites from the spring survey had a pup. One other site near the northeast end of Mackay Lake had three wolves, but no pups were seen. That den site was revisited the next day and no wolves at all were there. On the last day, on the way back to Yellowknife, the den site was revisited and still no wolves. Therefore, there is doubt that there were any pups at that site. All the other 20 den sites were not active. Three wolves were seen in the Point Lake area apparently hunting (no pups). All three were not collared; however, they were 5.7 km south from a den that was active this spring. So very few adult wolves seen (n=8) in total and only one pup.

Only eight collars were transmitting regularly during the survey, of which five were in the study area. Collar W403 was located and it was away from the whelping

den, walking on its own, and with no pups. A collar was picked up from a wolf that died near the northwest tip of Artillery Lake (W415). It was a young wolf (estimated three years old) and very skinny. It was half submerged in a small creek and only the top part of the collar was out of the water. Cause of death was likely drowning but brought on by starvation. Perhaps the wolf was trying to drink but was so weak it couldn't lift its head and then drowned.

Fifteen caribou were seen (groups of nine, three, and three) during the flying and another four caribou when on the ground at Daring Lake. The landscape appeared barren all over. However, some small groups of caribou would likely have been missed when radio-tracking at higher altitudes. This is the lowest number of wolves observed on these surveys and it is suspected that there has been extensive litter loss among wolves this year. Consequently, it is expected that the fall recruitment of pups will be very low. On the afternoon of 25 August two collared wolves were located in the boreal forest northwest of Yellowknife. Pups were not seen in either case, but seeing pups is not a given with trees and bush around.

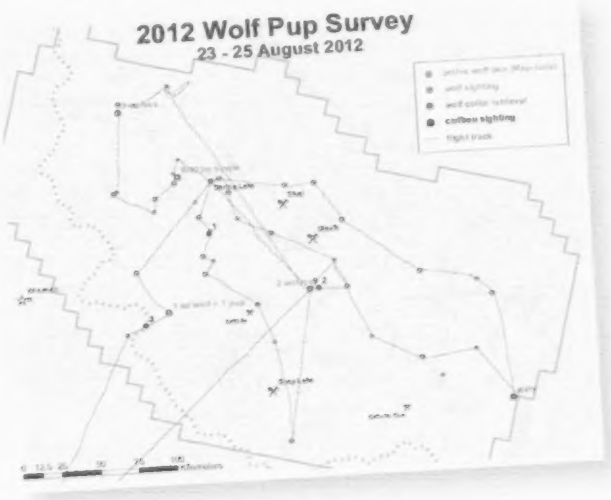
LONG-TERM PLANS AND RECOMMENDATIONS:

The study area will shift northwards to include parts of Nunavut within the Bathurst caribou summer range. Adult breeding female wolves will be captured and collared at den sites. Counts of pups at dens will be better evaluated because the breeding female can be tracked. Even if the home site has been moved pups can be located and counted. This effort will distinguish if pups at dens in late August have died or have been re-located elsewhere. Consequently we will determine if current trend monitoring for wolves is an accurate reflection of how wolves are responding to changing caribou densities.

COMMUNITY INVOLVEMENT:

Community representatives have provided advice during consultation meetings held at various communities.

Wolf pup survey area



Monitoring of the Nahanni Wood Bison Population

April 1, 2011 to March 31, 2012

MAIN INVESTIGATOR:

Nic Larter, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, Dehcho Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005035

LOCATION:

This is an ongoing study monitoring baseline population demography and disease presence of the Nahanni wood bison population. The study was initiated in 2002. The population ranges over NE British Columbia (BC), SE Yukon Territory and the SW NWT with the majority of the range in SW NWT along and adjacent to the Liard and lower reaches of the South Nahanni River Valleys.

PARTNERS:

- Environment and Natural Resources
- Government of British Columbia

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RATIONALE:

The Nahanni wood bison population was initially established with a transplant of bison to the area in June of 1980. Additional transplants in March 1989 and March 1998 augmented the population. Animals were documented dispersing south into BC soon after their release. An aerial population survey in March 2004 estimated 400 bison. A survey in March 2011 estimated 413 bison indicating limited population growth. Future population surveys will be required preferably at ≤5 year frequency.

The Nahanni population is currently afforded a measure of protection against infection with *Brucella abortus* (causes brucellosis) and *Mycobacterium bovis* (causes

Photo: GNWT/N. Larter, ENR

Collared Nahanni wood bison

tuberculosis) by maintaining a bison free zone to prevent contact with infected bison from Wood Buffalo National Park. Monitoring for these diseases through blood sample collections provides a measure of the effectiveness of the bison control program in addition to the assessment of disease status of the Nahanni bison population. Male-only wood bison hunting was initiated in 1998. The tag quota recently increased from two to seven annually.

Annual composition surveys provide data on calf production and juvenile overwinter survival and ratio of breeding age males to females. These data are useful for evaluating the impact of selective hunting, herd productivity, causes of death, predation on calves, and population survey estimates.

Recently, GPS and satellite collars have been deployed on male and female bison in order to better identify animal movements, the frequency of river crossings, population range, seasonal range, and animals frequenting communities, and to assess animal sightability in relation to aerial surveys. Bison presence in communities remains highly variable and we continue to assess different measures to mitigate bison presence and any perceived threats to human safety.

OBJECTIVES:

- To measure calf, yearling, and bull:cow ratios during the post-calving period;
- To monitor annual calf production and estimate overwinter survival of calf bison;
- To collect biological samples as and when available from harvested animals or those involved in motor vehicle collisions;
- To document seasonal movement patterns and range use of male and female bison throughout the range;
- To delineate the area used by the population and document animal movement into new areas of range;
- To document the frequency of river crossings by collared animals;
- To identify and monitor the presence, movements, and behaviour of wood bison in communities;
- To document the year round diet of Nahanni wood bison; and
- To monitor the Nahanni wood bison population for the presence of brucellosis, tuberculosis and Johne's disease.

METHODS:

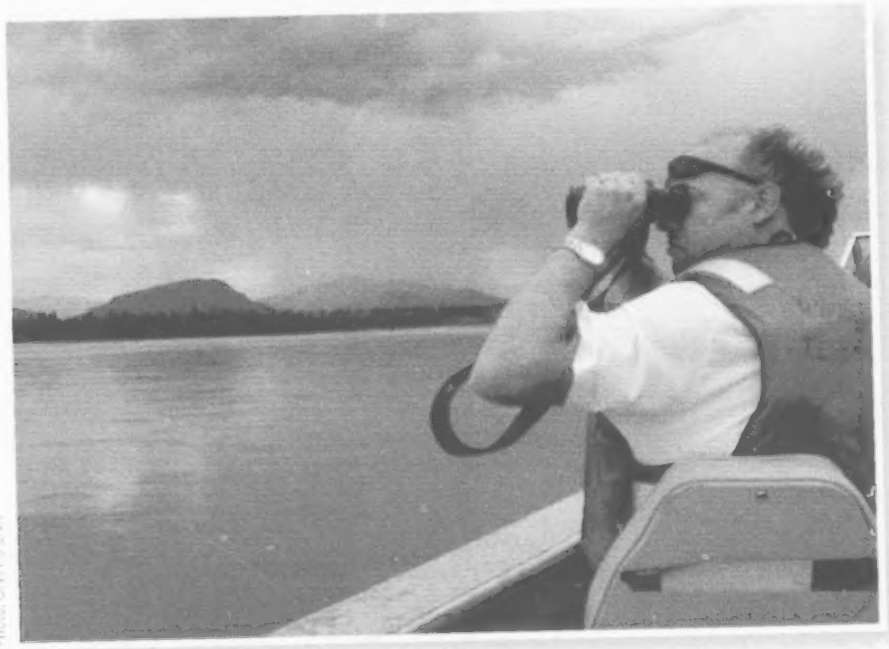
In mid-July we conduct a boat-based survey of bison along the Liard and South Nahanni Rivers from the BC border to Blackstone. Wood bison are classified as calves, yearlings, cows, juvenile bulls, sub adult bulls and mature bulls. Fresh fecal samples are collected during the survey. Environment and Natural Resources and biologists from Government of BC participated in the survey.

Location data from collared animals are processed and received daily. Data are entered into a database and used for GIS analyses. Location data are mapped on a biweekly basis.

With the change in regulations for hunter-killed bison (community quota) any biological samples are provided voluntarily. Any received are processed accordingly. Any available biological samples will be collected from dead or euthanized animals resulting from collisions with motor vehicles or other accidents.

RESULTS AND MAIN CONCLUSIONS:

- Two hundred and twelve bison were classified in July 2011, the most animals for any classification survey. The number of calves and yearlings/100



Surveying the shore for bison

females and overwinter survival estimates were calculated. Overwinter survival was lower than in most previous years.

- Maps of the survey results were circulated to local First Nations.
- Location data from the seven collared bison documented a substantial increase in the area used by the population to the west into the Kotaneelee drainage, and a 70 km movement of many animals to extend the range to the northeast along Highway 77 to Poplar River.
- Two bison were harvested under quota; some biological samples were received from these animals.

LONG-TERM PLANS AND RECOMMENDATIONS:

Following the results of the 2011 population survey, there needs to be continued annual monitoring of population demography. Another aerial survey to estimate the population should be scheduled by March 2016. Continued collaboration with Yukon Territorial Government and Government of BC on population monitoring and annual sex/age classification surveys for this population is needed. Inter-jurisdictional collaboration for similar surveys of the two northeastern BC populations should be explored. Location data will be used to assess seasonal range use and assist in delineating areas of high use in the range. Location data

will also be used to update the distribution of animals in the Nahanni wood bison population and document movement patterns in relation to linear corridors. Recommended actions include:

- Continued monitoring of wood bison frequenting communities.
- Maintaining active collars on the population over the long term should be seriously considered.
- Working with communities to develop range-specific NWT wood bison management plans.
- Continued monitoring for disease and the collection of biological samples from hunter-killed, darted or deceased animals as the opportunities arise.

COMMUNITY INVOLVEMENT:

The project was initiated based upon community requests. Local residents have participated as river guides for surveys, and as observers in all population surveys. Local residents are hired to assist with the collection of biological samples and distribution of meat from animals euthanized in or near communities. At annual community meetings and biennial Regional Wildlife Workshops, the program is evaluated and critiqued by local First Nations and program comments are discussed and addressed. As part of the NWT Bison Strategy, wood bison working groups have been established in Nahanni Butte and Fort Liard.

Bison found near a watering hole

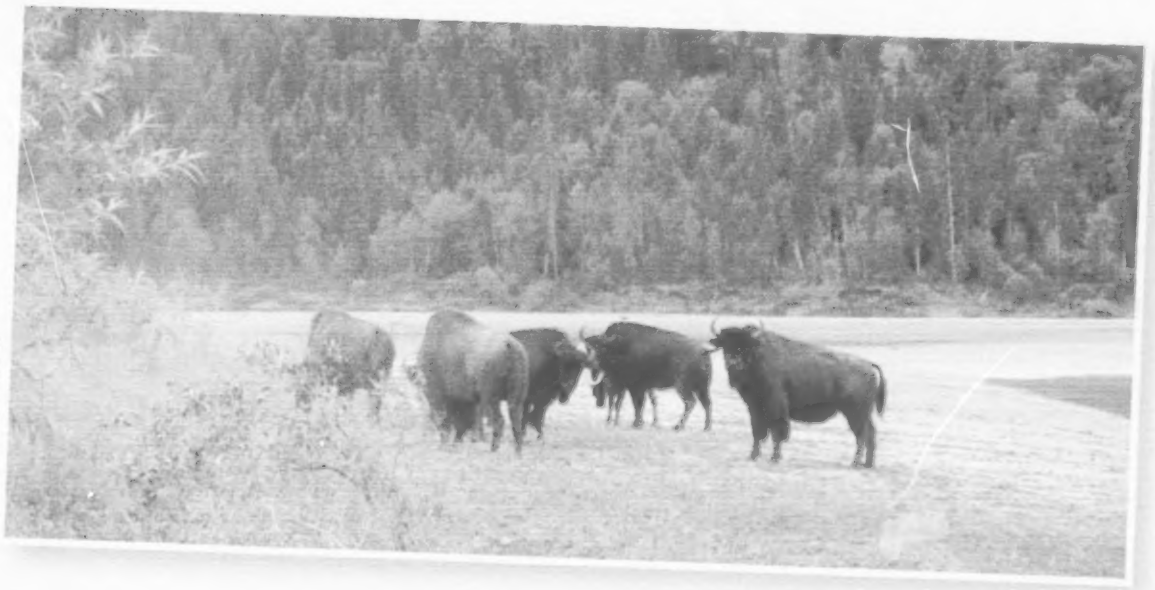


Photo GNWT/D. Allaire, ENR

Mackenzie Wood Bison Population Census – 2012

March 3 to 31, 2012

MAIN INVESTIGATOR:

Terry Armstrong, Wildlife Biologist (Bison), Environment and Natural Resources, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005770

LOCATION:

North of the Mackenzie River to Behchokǫ̀, and Great Slave Lake to the Horn Plateau.

PARTNER:

- Fort Providence Resource Management Board

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RATIONALE:

Periodic population estimates are important to wildlife population management, to evaluate the effects of management actions and assess progress toward population goals. There has not been an estimate of the Mackenzie wood bison population since 2008, when the census showed a 20% population decline since the previous estimate in 2000.

OBJECTIVES:

- To estimate the size of the Mackenzie wood bison population with a coefficient of variation of 20% or less.

METHODS:

The study area encompassed the distribution of the Mackenzie wood bison population. Transect lines were placed systematically at 2.5 km intervals over the main areas occupied by the population. Transects were flown using fixed-wing aircraft at a planned altitude of 150 m AGL at a speed of 100 kts. Bison were counted on both sides of the airplane and large groups were photographed to check field counts. An estimate of population size will be calculated using distance sampling methods.

RESULTS AND MAIN CONCLUSIONS:

The 19,700 km^2 study area was covered with just over 8,000 km of transect lines, and reconnaissance flights covered an additional 6,200 km^2. Conditions for observing animals were good to excellent most days due to complete, fresh snow cover and bright light conditions that helped make animals and their tracks more visible. We used two aircraft for a combined total of 71 hrs of survey time over six days of flying. We observed 183 groups of bison ranging from lone animals to a herd of 56, and we also saw moose, woodland caribou, two wolverines and a wolf. The estimate of the wood bison population was 710 animals.

LONG-TERM PLANS AND RECOMMENDATIONS:

The next estimate of the Mackenzie bison population is planned for 2016.

COMMUNITY INVOLVEMENT:

Observers from Fort Providence and Behchokǫ̀ were hired to participate in the survey.

Photo: GNWT/T. Armstrong, ENR

Survey crew members getting ready to head out for an aerial survey of wood bison

Wood bison surveyed in the Mackenzie area.

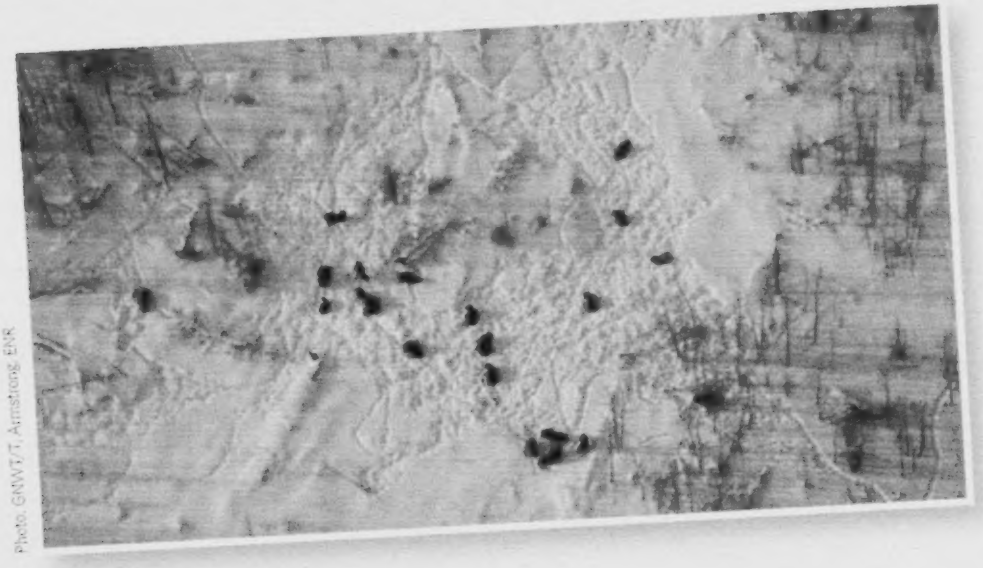

Photo: GNWT/T. Armstrong, ENR

Bison Control Area Program

December 2011 to April 2012

MAIN INVESTIGATOR:

Karl Cox, Wildlife Technician, Environment and Natural Resources, GNWT, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL004815 (April 1, 2011 to March 31, 2012),
WL004825 (January 1, 2012 to December 31, 2012)

LOCATION:

The bison control area is located between the NWT/Alberta border and the Mackenzie River and Great Slave Lake. It is bounded on the east by the Buffalo River and Wood Buffalo National Park (WBNP) and on the west by the Trout River and 121° longitude.

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RATIONALE:

Bison in WBNP and the Slave River Lowlands are infected with bovine tuberculosis and brucellosis, while both the Nahanni and Mackenzie bison populations are free of these livestock diseases. To help protect the disease-free status of these two populations, the Government of the Northwest Territories implemented the bison control area (BCA) program in 1987. The objective of this program is to reduce probability of disease transmission between herds by preventing bison from moving through, or establishing herds within the area south of the Mackenzie River between the Trout and Buffalo Rivers. The program is cost-shared with WBNP.

OBJECTIVES:

The goal of the bison control program in the NWT is to reduce the risk of infection of the Mackenzie and Nahanni-Liard herds with tuberculosis and brucellosis. Objectives of the program are:

- Continue surveillance of the BCA;
- Maintain the BCA free of bison and prevent the establishment of any herds within its boundaries; and
- Increase public awareness of the bison control program.

METHODS:

The BCA is stratified into three zones. Zone I is the area in which bison are most likely to be seen, since it is the section of the BCA that is nearest to both the Mackenzie Bison Sanctuary and WBNP. Therefore, the program focuses on this particular zone, with frequent aerial surveillance in the form of weekly shoreline patrols. Zone II is a larger zone and is surveyed twice a year during semi-comprehensive and comprehensive aerial surveys. Personnel include a pilot and one observer for shoreline patrols, and a pilot, navigator, and two observers for

the semi-comprehensive and comprehensive surveys. Surveillance of Zone III relies on reports from people living and travelling in the area instead of aerial surveys.

Aerial surveillance is conducted during the winter months when bison and signs of their presence (feeding craters and tracks) are most visible. Also, the probability of bison moving through the BCA is the greatest in the winter because we assume bison are more likely to walk across the frozen Mackenzie River than swim across it in the summer.

Public awareness of the BCA is promoted with the use of newspaper and radio advertisements in areas affected by the BCA. There are also signs placed where the highways cross the BCA boundaries.

RESULTS AND MAIN CONCLUSIONS:

During the 2011/12 season, there were no reports of bison either entering or approaching the BCA. Ten shoreline patrols, a semi-comprehensive (February) and comprehensive (March) survey were flown between December 16, 2011 and April 19, 2012. The aerial surveys were completed in 81.5 hours over 19 days. All 1,461 bison observations and all bison tracks observed during the surveys were seen north of the Mackenzie River, outside of the BCA. Snow cover, weather and light conditions for detecting bison and their sign from the air were good to excellent for most surveys except for a few days when low intensity, flat light conditions were encountered. If the light or weather conditions were exceptionally poor the flight was terminated or delayed until the next day.

Six of the eight BCA highway signs were replaced in 2012. These signs mark the BCA boundaries on the highways, promote public awareness, and provide contact information if bison are observed in the BCA. The last two signs are scheduled to be erected in the summer of 2013.

LONG-TERM PLANS AND RECOMMENDATIONS:

This program is ongoing. It is recommended that the BCA program continue until such time as the risk of disease transmission no longer exists, or a better method of reducing that risk is discovered.

COMMUNITY INVOLVEMENT:

Local observers participate in aerial surveys. Throughout the history of the BCA, community members have proven to be extremely valuable as the majority of occurrences of bison in the BCA have been reported by community members.

Wood bison cow and calf.

Photo: GNWT/J. Nagy, ENR

Slave River Lowlands Bison Population Studies

April 1, 2011 to March 31, 2012

MAIN INVESTIGATOR:

Allicia Kelly, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL004816 [2011 field work] and
WL500043 [2012 field work]

LOCATION:

The area of study is the known bison range in the Slave River Lowlands between Fort Smith and Fort Resolution. The area includes both east and west sides of the Slave River but excludes the area of Wood Buffalo National Park.

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RATIONALE:

Composition surveys

Composition surveys are conducted as one component of monitoring the Slave River Lowlands bison. Combined with other population information such as distribution, abundance, and health and condition, these data are used to make inferences on population dynamics and base recommendations and decisions on wildlife management issues. In addition to providing data on herd composition, particularly calf/cow ratio at the end of the calving period (i.e. an estimate of productivity), annual composition data provide a method to monitor population abundance during the intervening years between population surveys. Changes in calf/cow or yearling/cow ratios, particularly low values, may be indicators that managers need to examine populations more closely to assess population changes and their causes. Correlating increases in herd size with calf/cow ratios assumes that the rate of death of cows is low compared to calves, among others. These assumptions may be true most of the time and may only deviate under abnormal conditions (e.g. high harvest of cows during the year).

Anthrax surveillance

Anthrax is a naturally occurring infectious disease caused by the bacterium *Bacillus anthracis*. Once introduced into an area, anthrax can be maintained in the environment by extremely resistant spores that may remain dormant in the soil for many years. Certain environmental and climatic conditions can facilitate an outbreak of anthrax. The exact nature of these predisposing conditions is not completely understood, but a very wet spring followed by a dry, hot summer appears to be one combination that promotes outbreaks. Anthrax outbreaks in northern Canada have implications for bison management and ongoing recovery efforts

for the threatened wood bison, and may pose a health risk to humans and other wildlife. Federal and territorial agencies have historically initiated control measures aimed at breaking the cycle of infection. These measures include large-scale carcass detection and disposal operations to minimize scavenging and release of anthrax spores into the environment. Disposal is more effective when carcasses are detected early.

OBJECTIVES:

- To measure calf, yearling, and bull to cow ratios during the post-calving period for bison in the Slave River Lowlands; and
- To monitor the Slave River Lowlands herd for the occurrence of anthrax related mortalities. If any suspected anthrax mortalities are detected, the Anthrax Emergency Response Plan (AERP) would be activated and carcasses would be

Photo: GNWT/K. Cox, ENR

Composition survey of wood bison in the Slave River Lowlands.

dealt with according to this plan. An increase in aerial surveillance would also occur if anthrax is suspected.

METHODS:

Composition survey

Composition surveys are conducted in early to mid-July to collect sex and age data from a representative portion of each population. Observers, usually a spotter and a data recorder, are positioned on the ground near groups of bison by helicopter. The recorder directs the pilot to position the helicopter so that the bison move past the observers' position at a suitable distance at a walk or trot. Bison are classified as calves, yearlings, adult females (≥2 years old), and three classes of males (B1 are immature males aged 2-3 years, B2 are young males 4-5 years of age, and B3 are mature males ≥5 years).

Anthrax surveillance

In coordination with the composition survey, a biweekly fixed-wing flight is conducted over the core range (i.e. Stan's, Hook Lake, Tower and North Prairies, Grande Detour and Little Buffalo) to determine whether there are any fresh bison carcasses during the summer anthrax season. If any suspected anthrax mortalities are detected, the Anthrax Emergency Response Plan (AERP) would be activated and carcasses would be dealt with according to this plan. An increase in aerial surveillance would also occur if anthrax is suspected.

Photo: GNWT/K. Cox, ENR

Wood bison surveyed and classified along the Slave River Lowlands.

RESULTS AND MAIN CONCLUSIONS:

Composition survey

2011 - A composition survey was completed on July 7, 2011. A total of between 800-1,000 bison were seen while 483 were classified. There were 27.6 calves/100 cows and 11.3 yearlings/100 cows.

2012 - A composition survey was not conducted in the Slave River Lowlands in 2012 as staff resources were required to respond to the 2012 anthrax outbreak in the Mackenzie bison herd range.

Anthrax surveillance

2011 - There were a total of seven fixed wing flights between June 22, 2011 and August 16, 2011. One bison carcass was found on June 24, 2011, but with further inspection and testing it was deemed unlikely to be anthrax. The carcass was treated with formaldehyde and covered with a tarp as a precaution. No further cases were found.

2012 - There were a total of five fixed wing flights between June 18, 2012 and August 14, 2012. No bison carcasses were found in the Slave River Lowlands.

LONG-TERM PLANS AND RECOMMENDATIONS:

This program is ongoing and will continue in the future. Composition surveys are conducted annually as part of overall population monitoring. The Slave River Lowlands bison population was last estimated in 2009 (total population size: 1,790±323). It is recommended that the bison population size and distribution be estimated every four years.

Anthrax surveillance is an ongoing project. Long term plans include the completion and documentation of anthrax surveillance flights in the Slave River Lowlands biweekly from June to August each year.

COMMUNITY INVOLVEMENT:

Results are shared and discussed at community based meetings including the biennial Regional Wildlife Workshops. Local observers are used when possible for surveys.

Wildlife Health, Condition and Genetic Monitoring

January 2012 to December 2012

MAIN INVESTIGATOR:

Brett Elkin, Disease/Contaminants Specialist, Environment and Natural Resources, GNWT

WILDLIFE RESEARCH PERMIT NUMBER:

WL005768

LOCATION:

NWT-wide.

PARTNERS:

- Local hunters and trappers
- Members of the general public
- Environment and Natural Resources: biologists and Renewable Resource Officers
- Canadian Cooperative Wildlife Health Centre
- Canadian Food Inspection Agency
- University of Saskatchewan Western College of Veterinary Medicine
- University of Calgary Faculty of Veterinary Medicine

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RATIONALE:

Although most wild animals are healthy, diseases and parasites do occur in any wildlife population. Some diseases and parasites are naturally occurring and appear to cause little problem in their host, while others have the potential to impact wildlife at both the individual animal and population level. Some of these diseases and parasites can also affect people and domestic animals.

Samples from animals harvested by hunters and trappers, found sick or dead, or handled during wildlife research or management activities by Environment and Natural Resources staff, other wildlife agencies or university researchers can provide valuable health, condition and genetic information on wildlife populations. These samples provide an opportunity to monitor diseases and contaminants of particular importance to wildlife and human health, and to identify new and emerging diseases. Taking advantage of samples from these existing activities provides additional valuable information for making wildlife management decision and providing public information.

OBJECTIVES:

- To determine the cause of sick or dead wildlife found, harvested or handled by hunters, trappers, biologists, wildlife researchers, Renewable Resource Officers, or the general public;
- To assist hunters and trappers by testing samples from harvested wildlife to determine what diseases or parasites are present, and the implications for consumption of the carcass;
- To work cooperatively with hunters, trappers, biologists, Renewable Resource Officers and members of the general public to monitor the health and condition of wildlife on an on-going basis;

- To identify the types, relative levels and geographical distribution of diseases, parasites and contaminants found in wildlife across the NWT;
- To increase community awareness of diseases and parasites; and
- To collect genetic information that will contribute to the understanding and management of wildlife populations.

METHODS:

Samples are collected in several different ways.

- Local hunters, trappers and Renewable Resource Officers frequently submit samples from harvested wildlife. They generally provide detailed information on the animal and the particular case, and often provide additional information on the occurrence and patterns of similar cases within their harvest areas.
- Members of the general public, wildlife biologists or Renewable Resource Officers may also submit samples from wildlife that are sick or found dead.
- Samples from animals handled during wildlife research or management activities that may be submitted by biologists, technicians, other wildlife researchers or Renewable Resource Officers are also submitted for disease testing.
- Whole animals or samples of the affected tissues or body parts are collected, as well as other samples necessary to determine health status, body condition and age.
- Samples are analysed for diseases, parasites, contaminants, condition and/or genetics. In many cases, this requires the shipment of samples to specialised laboratories to determine the cause of the abnormality. Results of the testing are provided to the individual(s) who submitted the sample, and recorded in an NWT disease database to monitor disease trends across the NWT and over time.

Photo: GNWT/ENR

Bison carcass being incinerated to prevent the spread of anthrax spores.

Dead wildlife found and submitted for disease testing

Photo: GNWT/ENR

RESULTS AND MAIN CONCLUSIONS:

Hunter submitted samples in 2012 (field and lab tested).

Samples Submitted for Disease Surveillance:

- Anthrax surveillance in Mackenzie Bison Sanctuary and Slave River Lowlands June through August.
- Testing and treatment of major anthrax outbreak (440 cases).
- Barren-ground caribou health and condition surveillance: Bathurst, Beverly, Ahiak and Bluenose-East (140 tested).
- Brucellosis and TB surveillance in wood bison.
- Brucellosis screening in muskox (Banks Island).
- Chronic Wasting Disease surveillance: white-tailed deer and caribou.
- Echinococcus surveillance – multiple species.
- Erysipelas outbreak in muskox (estimated 200 cases).
- National Avian Influenza Surveillance - birds (not detected).
- National West Nile Virus - birds and mosquitoes (not detected).
- Rabies surveillance (11 submissions, 6 positive).
- Trichinella surveillance – multiple species.
- Contaminant testing in caribou, Dall's sheep, mountain goats, sheep and moose (metals: 81; radionuclides: 98).
- Sahtu community wildlife health monitoring project.

Products Produced:

- Results reported to individual hunters and trappers.
- NWT wildlife disease surveillance and database.
- NWT rabies surveillance and database.
- Participation in national wildlife disease, Avian Influenza, West Nile Virus and CWD surveillance efforts.

Photo: GNWT/ENR

Wildlife veterinarian geared up to deal with dead, diseased wildlife.

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife disease surveillance is ongoing every year.

Long term testing will continue on any hunter submitted samples, animals found dead, and the investigation of disease cases or outbreaks. Results of this testing will be used to provide information and recommendations to individual harvesters, the public, and wildlife management agencies and wildlife co-management boards.

COMMUNITY INVOLVEMENT:

Hunters and trappers frequently bring in samples or provide reports of diseases, parasites or abnormalities in harvested wildlife. Identification of the diseases or parasites involved in these cases can be important to make decisions on consumption of meat from the affected animal. Sick or dead animals are also found periodically in the wild, and testing is required to determine the cause of death and potential significance for other wildlife and people. Information provided by hunters and trappers on the occurrence of diseases and parasites can also be used to identify areas requiring further monitoring or testing.

Local hunters, trappers and members of the general public are encouraged to submit samples of any abnormalities they find in the wildlife they harvest. Results of testing are provided back to the individuals submitting the samples following diagnostic testing.

Selwyn Project Baseline Studies

January 2012 to January 2013

MAIN INVESTIGATOR:

Selwyn Chihong Mining Ltd.

WILDLIFE RESEARCH PERMIT NUMBER:

WL005766

LOCATION:

All wildlife studies took place within an area adjacent to the Howard Pass Access Road (HPAR) – an existing 79 km gravel-surfaced road that commences at km 188 of the Nahanni Range Road north of the Cantung Mine.

PARTNERS:

- Selwyn Chihong Mining Limited
- Madrone Environmental Services Limited
- Richard Farnell, Wildlife Biologist

CONTACTS:

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Madrone Environmental Services Ltd.
1081 Canada Avenue
Duncan, BC V9L 1V2
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(E-mail) tania.tripp@madrone.ca

RATIONALE:

The data will be used to describe the local environment to support the environmental assessment process.

OBJECTIVES:

- To support permit applications and the environmental review process;
- To predict and mitigate effects to the environment and wildlife that may result from project development;
- To provide pre-development information in support of any future environmental affects monitoring program; and
- To contribute to regional studies for assessing and managing potential cumulative effects.

METHODS:

A late winter ungulate (moose and caribou) survey was flown on March 7 and 8, 2012. A spring caribou calving survey was flown on May 23, 2012. A summer caribou post-calving survey was flown on July 14, 2012. A caribou fall rut survey was flown on September 29, 2012 and an ungulate post-rut survey was flown on November 1, 2012.

RESULTS AND MAIN CONCLUSIONS:

Limited interaction with moose and caribou relative to the HPAR was observed during the late winter and post-rut survey periods. More comprehensive results from the 2012 field work are presented in the annual wildlife monitoring report available from Selwyn Chihong Mining Ltd. (SCML).

LONG-TERM PLANS AND RECOMMENDATIONS:

At this time SCML plans to replicate the late winter, post-calving, and post-rut surveys to strengthen the information base for these life cycle periods. Further

surveys during the calving and rutting periods would likely not strengthen SCML's understanding of ungulate occurrence relative to the HPAR as there is limited or no occurrence.

COMMUNITY INVOLVEMENT:

SCML has engaged with government regulators, First Nations, and interested persons and communities on information and activities with the Selwyn Project since 2006.

Wildlife Monitoring - Enbridge Right of Way

December 1, 2011 to March 30, 2012

MAIN INVESTIGATOR:

Ann Marie Tout, Manager, Enbridge Pipelines (NW) Inc.

WILDLIFE RESEARCH PERMIT NUMBER:

WL005767

LOCATION:

Enbridge Right of Way (Kp 78 - Kp 160) from December 1, 2011 to March 21, 2012

Enbridge Right of Way (Kp 286 - Kp 330) from February 2, 2012 to February 24, 2012

Enbridge Right of Way (Kp 444 - Kp 512) from January 21, 2012 to March 30, 2012

Enbridge Right of Way (Kp 541 - Kp 585) from December 23, 2011 to March 29, 2012

Enbridge Right of Way (Kp 632 - Kp 707) from January 23, 2012 to March 12, 2012

PARTNERS:

- Tulita Renewable Resource Council
- Pehdzeh Ki First Nation
- Liidlii Kue First Nation
- Fort Simpson Métis Nation Local #58
- Sambaa K'e Dene Band

CONTACT:

Ann Marie Tout, Manager
Enbridge Pipelines (NW) Inc.
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Norman Wells, NT X0E 0V0
(P) 867-587-7000
(F) 867-587-7001

RATIONALE:

The wildlife monitoring program was reinstated at the request of the communities involved.

OBJECTIVES:

- To support and encourage community-based programs to document wildlife sightings and wildlife tracks along the Enbridge Right of Way.

METHODS:

Monitors traveled various sections of the Right of Way by snowmobile and documented their observations of wildlife tracks.

RESULTS AND MAIN CONCLUSIONS:

During the time period of December 2011 to March 2012, observers reported seeing 168 sets of rabbit, 80 sets of marten, 58 sets of wolf, 17 sets of lynx, 58 sets of moose, 99 sets of caribou, and 18 sets of fox tracks.

LONG-TERM PLANS AND RECOMMENDATIONS:

Pending permitting approvals, this program will continue on an annual basis.

COMMUNITY INVOLVEMENT:

The value of the 2012/2013 program was increased based on feedback from the participants.

Photo: J. Obst

Baseline Wildlife Studies
Gahcho Kué Project

January 1, 2012 to December 31, 2012

MAIN INVESTIGATOR:
Golder Associates Ltd.

WILDLIFE RESEARCH PERMIT NUMBER:
WL500011

LOCATION:
The regional study area (RSA) for wildlife studies is defined by a 70x80 km rectangle centered on Kennady Lake, NWT (63° 26'N, 109° 12'W). The project is approximately 280 km northeast of Yellowknife and 140 km northeast of Łutselk'e.

PARTNERS:
- DeBeers Canada Inc.

CONTACTS:
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Daniel Coulton, Wildlife Biologist
Golder Associates Ltd.
9, 4905 48th Street
Yellowknife, NT X1A 3S3
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(E-mail) daniel_coulton@golder.com

RATIONALE:
Baseline studies were completed to augment existing information on wildlife species and habitat surrounding the project. Data obtained will be used to predict and mitigate effects to wildlife from project development, provide pre-development information in support of a future environmental effects monitoring program, and contribute to regional studies for assessing and managing potential cumulative effects.

OBJECTIVES:
- To further describe the occurrence, relative abundance, distribution, and habitat use of wildlife in the study area;
- To predict effects to the environment and wildlife from project development;
- To provide baseline data for testing environmental effects predictions and the effectiveness of mitigation; and
- To guide further mitigation and adaptive management for reducing unexpected effects.

METHODS:
Caribou surveys: Up to four aerial surveys will be completed on existing transect lines within the regional study area - one survey in the spring during the caribou northern migration, and one to three surveys in the fall during the caribou post-calving migration and rut. Observers will record caribou numbers, distribution, behaviour, group size and composition, habitat type, and snow track densities. Incidental observations of other wildlife will also be recorded. Survey transects will be flown by helicopter or small airplane at an altitude of 120 m AGL at an average speed of 150 km/h. Caribou behaviour monitoring (using ground-based techniques) will be made when aerial surveys or satellite collar data show that sufficient numbers of caribou are present in the study area.

Wolverine Surveys: Up to two snow track surveys will be completed from February to April 2012. The wolverine survey will use 51 transects, 4 km in length, placed throughout the RSA. Transects will be surveyed by snowmobile. The technique was developed through discussions with a number of Aboriginal hunters who contributed important traditional knowledge of wolverine behaviour on the tundra. One community assistant will be present during the surveys to aid in the identification of tracks. When tracks are found, the location, direction and number will be recorded.

Water bird surveys: A single survey is proposed to document water birds within the perimeter of Kennady Lake and a suitable reference lake (to be selected by the field crew) will be flown by helicopter at 30-50 m altitude. Helicopter speeds will vary between 40 and 80 km/h, depending on shoreline complexity. The survey will likely be completed in mid-June. During this time, the perimeter of the lakes will likely be free of ice, confining the birds to a narrow band of water. All water birds observed will be recorded, including the species, location and number of drakes and hens.

MAIN RESULTS AND CONCLUSIONS:

Detailed results are available in the 2012 Wildlife Baseline Studies Summary Report for the Gahcho Kué Project.

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife baseline studies and reporting will continue as the permitting process for the project proceeds.

COMMUNITY INVOLVEMENT:

DeBeers has been involved in community engagement activities for the project for many years; this is an on-going process. Updates on wildlife studies will be provided to the surrounding communities and will be maintained as the project moves forward. Any questions can be forwarded to Cathie Bolstad of DeBeers Canada Inc., (P) 867-766-7300.

Meetings to discuss project-related activities were held with the surrounding communities in 2012 subject to their availability. Results of the baseline field studies will be communicated through reports and community presentations.

DeBeers convened a wildlife effects monitoring plan (WEMP) development working group in August 2012 and held a WEMP workshop in September 2012, with representatives from government and Aboriginal groups, to develop the WEMP for the project. The proposed wildlife monitoring for 2013 outlined in this application is consistent with the outcomes of those engagement activities.

Each wildlife study in 2012 included assistants from North Slave communities. Local assistants were selected based on their knowledge of the study area, ability to work as a field technician and/or interest in learning to carry out wildlife surveys. Local assistants included Brenda Michel, Pete Enzoe and Dillon Enzoe of Łutselk'e, and Joel Dragon-Smith of Yellowknife.

De Beers Snap Lake Mine: Wildlife Effects Monitoring Program (WEMP)

January 2012 to December 2012

MAIN INVESTIGATOR:

Alex Hood, Environmental Superintendent,
De Beers Canada Inc.

WILDLIFE RESEARCH PERMIT NUMBER:

WL500012

LOCATION:

All wildlife studies took place within a study area of 31 km radius around the Snap Lake Mine, a total area of 3,019 km^2. These studies occurred at various times from January 1, 2012 to December 31, 2012.

PARTNERS:

- De Beers Canada Inc.
- Golder Associates Ltd.
- Snap Lake Environmental Monitoring Agency

CONTACTS:

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Alexandra Hood, Environmental Superintendent
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RATIONALE:

The wildlife effects monitoring program (WEMP) is a requirement of the project's environmental agreement (Article VII, 7.2c) and land use permit (Condition 36).

The annual Snap Lake WEMP was designed to detect, measure, and manage mine-related impacts to wildlife habitat, wildlife presence, behaviour and distribution, and wildlife injuries and mortalities. The WEMP is intended to provide information for the mine's environmental management system (EMS) to adaptively manage the mine to protect wildlife and wildlife habitat, and to contribute to regional monitoring information that may then be used to assess cumulative effects of mining on wildlife.

OBJECTIVES:

Objectives of the monitoring studies were to determine if the mine influences:

- the density, distribution, group composition and behaviour of caribou;
- the relative activity (presence) and distribution of grizzly and black bears; and
- the relative activity (presence) and distribution of wolverine.

Though not part of the WEMP, wolf den activity was monitored to provide regional information to the Department of Environment and Natural Resources.

METHODS:

A summary of the methods used and approximate dates are provided below. Further details on methods can be found in the annual Wildlife Effects Monitoring Program reports, the Snap Lake Wildlife Monitoring Plan, and the Snap Lake Wildlife Management Plan.

An aerial survey was flown on November 2, 2012 by helicopter. Observers recorded number, group

composition, behaviour and location of caribou within established survey transects in the study area.

A new study design based on hair snagging stations for bears was continued in 2012. The forty hair snagging stations were checked four times for bear hair between August and September. Hair snagging stations were scented with commercial lures.

A pair of wolverine snow track surveys was completed by snowmobile during late March and April. The wolverine surveys included 50 transects, each 4 km in length, distributed throughout the study area. Only 41 transects were surveyed during the second survey due to warming temperatures and lack of snow cover.

Known wolf dens within the study area were surveyed by helicopter in June. Each den site was inspected for fresh sign (e.g. animals, tracks, scat, fur, and prey remains) as evidence of use.

RESULTS AND MAIN CONCLUSIONS:

Results of 2012 wildlife programs will be presented in the Snap Lake Wildlife Effects Monitoring Program report. There continue to be interactions with wildlife on site.

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife monitoring will continue during the entire operational period of the Snap Lake Mine, as per the Snap Lake Mine WEMP.

COMMUNITY INVOLVEMENT:

Community feedback on the WEMP has been provided through the Snap Lake Environmental Monitoring Agency. Pete Enzoe of Łutselk'e participated the grizzly bear hair snagging program.

Photo: A. Hood

Wolverine tracks.

Baseline Wildlife Studies for Fortune Minerals NICO Project

February 2012 to December 2012

MAIN INVESTIGATORS:

Daniel Coulton, Wildlife Biologist, Golder Associates Ltd.

WILDLIFE RESEARCH PERMIT NUMBER:

WL500013

LOCATION:

15 km radius from NICO Project basecamp with a 5 km buffer on either side of the proposed all-weather access road.

CONTACTS:

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(F) 867-873-6379
(E-mail) daniel_coulton@golder.com

RATIONALE:

Baseline studies will be completed to augment existing information on wildlife species and habitat surrounding the project and the all-weather access road. Data obtained will be used to predict and mitigate effects to wildlife from project development, provide pre-development information in support of a future environmental effects monitoring program, and contribute to regional studies for assessing and managing potential cumulative effects.

OBJECTIVES:

- To further describe the occurrence, relative abundance, distribution and habitat use of wildlife in the study area;
- To predict effects to the environment and wildlife from project development;
- To provide baseline data for testing environmental effects predictions and the effectiveness of mitigation; and
- To guide further mitigation and adaptive management for reducing unexpected effects.

METHODS:

Ungulate Surveys: Up to four aerial surveys for caribou and moose will be completed on existing transect lines within the regional survey area (RSA). Observers will record caribou and moose numbers, distribution, behaviour, group size and composition, habitat type and snow track densities.

Raptor Nest Surveys: A wide range of raptors (eagles, hawks, falcons and owls) have been observed in the RSA. A helicopter will be used to visit known raptor nests within the RSA. The survey will take place in early June to identify which nests are occupied, and again in July to count the number of young in each nest. Nests will be surveyed using a quick fly-by to minimize disturbance.

Water Bird Surveys: Aerial surveys for water birds will take place in June and July along the RSA. The survey uses established methods used by the Canadian Wildlife Service. All water birds observed within 200 m of the transect line are recorded by observers on each side of the helicopter.

RESULTS AND MAIN CONCLUSIONS:

No results and main conclusions submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

No long-term plans and recommendations submitted.

COMMUNITY INVOLVEMENT:

Participants from local communities were asked to assist with the wildlife surveys. Communities were consulted regarding activities at the project site.

Chemical Management Plan Wildlife Monitoring Program

June 2012

MAIN INVESTIGATORS:

Myra Robertson, Waterfowl Population Biologist for the Western Arctic, Canadian Wildlife Service and Pamela Martin, Ecotoxicology and Wildlife Health Division, Environment Canada

WILDLIFE RESEARCH PERMIT NUMBER:

WL500037

LOCATION:

North Arm of Great Slave Lake, NWT.

PARTNERS:

- Canadian Wildlife Service
- Ecotoxicology and Wildlife Health Division, Environment Canada

CONTACT:

Myra Robertson, Waterfowl Population Biologist
Canadian Wildlife Service
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RATIONALE:

Environment Canada's chemicals management plan has funded a national monitoring program to track the occurrence of emerging and priority chemical compounds in all components of the environment, including wildlife. As part of this program, herring gull eggs are being collected from the North Arm of Great Slave Lake and elsewhere in Canada. Eggs are providing information on contaminant levels in different regions of Canada.

Herring gulls and other gulls have been used to monitor contaminants in aquatic environments for over 30 years. They are used because they are known to accumulate organic contaminants and nest in colonies making egg collection relatively simple. Herring gulls lay three eggs but seldom rear more than two chicks, thus the removal of a single egg from a nest does not typically reduce breeding success.

OBJECTIVES:

- To assess the toxicological characteristics of local gulls in relation to national data.

METHODS:

Nesting colonies on the North Arm were visited by boat in June for three years (2010-2012).The field crew landed on the nesting islands, collected eggs, and then quickly left the colony to minimize disturbance. Only one egg from each nest was collected. A total of 35 eggs were collected on the North Arm over the three-year period (15 in 2010, 10 in 2011, and 15 in 2012).

Eggs were shipped to the Environment Canada laboratory in Ontario for contaminants analysis. Eggs undergo toxicology analysis for flame retardants and other chemicals of concern. Contaminant levels are being compared to other eggs collected across the country.

RESULTS AND MAIN CONCLUSIONS:

Preliminary results from 2010 and 2011 show that levels of PFCs (chemicals like Scotchguard™) and flame retardants were similar to those found at island colonies on the Atlantic and Pacific coasts of Canada, but were only a fraction of those found in gull eggs from the Great Lakes, St. Lawrence and prairie areas. Eggs from 2012 are still undergoing analysis.

LONG-TERM PLANS AND RECOMMENDATIONS:

Our current sample of eggs is adequate, and no further egg collections on the North Arm are planned at this time. When all analyses are complete, results and recommendations will be shared with communities and other stakeholders.

COMMUNITY INVOLVEMENT:

We thank Moise Rabesca from Behchokǫ̀ for providing boating and guiding services in 2011 and 2012. In 2011, EBA consultants Steve Moore and Karla Langlois collected eggs for the Canadian Wildlife Service (CWS).

CWS in Yellowknife hires local summer students with backgrounds in biology or renewable resources to assist in the field and office. Mark Wasiuta, a summer student with the CWS, assisted with the egg collection in 2010.

Photo: Environment Canada

Herring gull nest.

Herring gulls observed on an island in the North Arm, Great Slave Lake.

Photo: Environment Canada

Wildlife Effects Monitoring Program (WEMP)

July 15, 2012 to July 15, 2013

MAIN INVESTIGATOR:

Harry O'Keefe, Environmental Advisor Wildlife,
Dominion Diamond Ekati Corporation

WILDLIFE RESEARCH PERMIT NUMBER:

WL006882

LOCATION:

The wildlife effects monitoring program (WEMP) will occur on the Ekati Diamond Mine property, approximately 300 km northeast of Yellowknife. The WEMP will focus on the 1,600 km^2 monitoring study area surrounding the mine (64° 40'N, 110° 43'W).

CONTACT:

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(Website) www.ddcorp.ca

RATIONALE:

The requirement for wildlife effects monitoring at the Ekati Diamond Mine is described in the Environmental Agreement between Canada (formerly DIAND), the Government of the Northwest Territories (GNWT), Environment and Natural Resources (ENR) and BHP Billiton (January 1997). Wildlife effects monitoring has taken place annually since 1997. Wildlife research permit WL500090 includes the continuation of this program from July 15 2012 to July 15 2013.

OBJECTIVES:

- To test impact predictions and efficacy of mitigation measures for the following species:

Caribou: to monitor the potential effects of the following mine activities: potential collisions with vehicles, incidents involving aircraft, general disturbance from the mine, roads as potential barriers, incidents at pits and the Long Lake containment facility.

Grizzly bears: to monitor the potential effects of the following mine activities: potential collisions with vehicles, disturbance possibly affecting bear activity level, and the mine possibly attracting bears.

Wolves: to monitor the potential effects of the following mine activities: potential collisions with vehicles, disturbance possibly affecting den use and the mine possibly attracting wolves.

Wolverine: to monitor the potential effects of the following mine activities: potential collisions with vehicles, disturbance possibly affecting their presence near the mine and the mine possibly attracting wolverine.

Upland breeding birds: to obtain a species count by conducting the North American breeding bird survey (NABBS) and maintaining incidental records of upland breeding birds, shorebirds and waterfowl.

Falcons: to monitor the potential effects of the following mine activities: disturbance possibly affecting occupancy and productivity.

METHODS:

Continuation of monitoring programs set out in previous years for caribou, grizzly bears, wolves, wolverine, upland breeding birds and falcons are planned to continue this year. Wildlife observations and incidents will be recorded, incidental observations during helicopter flights, and landfill and waste bin monitoring will continue. Dominion Diamond Ekati Corporation will continue to share information with ENR biologists and to assist ENR with aerial surveys for den occupancy and pup productivity of wolves, hair snagging DNA projects lead by ENR, and regional falcon occupancy and productivity surveys.

RESULTS AND MAIN CONCLUSIONS:

Results of 2012 wildlife monitoring program will be presented in the Ekati Diamond Mine 2012 Wildlife Effects Monitoring Program report.

LONG-TERM PLANS AND RECOMMENDATIONS:

Ekati Diamond Mine's WEMP will be undergoing a revision review process from July 2013 to April 2014. As a component of this review, Ekati personnel will be conducting technical and community workshops to present updates and changes to the WEMP.

COMMUNITY INVOLVEMENT:

An important aspect of the program continues to be community consultation to discuss the WEMP, ensuring the involvement of Aboriginal people and concerned stakeholders. Discussions with all groups are ongoing. During the 2012 WEMP, representatives from all Impact Benefit Agreement (IBA) groups were invited to site for one week to participate in our caribou monitoring programs. The purpose of this visit was to increase their understanding of the work done on site to protect wildlife and increase our understanding of traditional indicators of caribou health.

Wildlife Monitoring Program for the Diavik Diamond Mine

June 25, 2011 to June 25, 2012

MAIN INVESTIGATOR:

Stephen Bourn, Superintendent Environment, Diavik Diamond Mines Inc.

WILDLIFE RESEARCH PERMIT NUMBER:

WL006889

LOCATION:

The wildlife monitoring program will be conducted in the Diavik wildlife study area, centered on Lac de Gras, NWT.

CONTACT:

David Wells, Superintendent Environment
Diavik Diamond Mines Inc.
PO Box 2498
Yellowknife, NT X1A 2P8
(P) 867-669-6500 ext. 5536
(F) 867-669-9058

RATIONALE:

To monitor wildlife within the vicinity of the mine.

OBJECTIVES:

- To verify the accuracy of the predicted effects determined in the Environment Effects Report (Wildlife 1998) and the Comprehensive Study Report (June 1998); and
- To ensure that management and mitigation measures for wildlife and wildlife habitat are effective in preventing significant adverse impacts to wildlife.

METHODS:

Barren-ground caribou: scanning observations, GPS locations, ground-based observation surveys and road observations.

Grizzly bear: grizzly bear monitoring throughout 2012 was limited to incidental sightings within the wildlife study area.

Wolverine: snow track surveys, DNA research, regular inspections of food and waste compliance, incidental observations, and wolverine mortalities associated with mining activity are reported and documented.

Waterfowl and other aquatic birds: ground-based surveys.

Raptors: ground-based monitoring conducted for both pit wall and mine infrastructure nesting. Any incidental observations documented.

RESULTS AND MAIN CONCLUSIONS:

Successful implementations of ground-based surveys were conducted. Mine footprint extent and habitat loss remained within the projections of the environmental assessment.

LONG-TERM PLANS AND RECOMMENDATIONS:

Diavik Diamond Mines Inc. (DDMI) has been working collectively with the Government of the Northwest Territories (GNWT), other diamond mining companies and their respective environmental advisory boards to review the existing wildlife programs at the mines and determine areas for improvement. During 2011, working groups focused on the objectives for the grizzly bear monitoring program in order to improve consistency and provide a regional benefit. DDMI worked in conjunction with the GNWT, BHP-Billiton, DeBeers Canada, advisory boards and communities to develop a joint grizzly bear monitoring program for 2012 implementation. DDMI also plans to work with the Environmental Monitoring Advisory Board traditional knowledge panel during 2012 to improve caribou behavioral monitoring efforts through ground observation methods and techniques. Caribou aerial surveys will resume in 2012. Additionally, DDMI has continued visiting communities to inform them of the results and status of the current programs.

COMMUNITY INVOLVEMENT:

Northern residents will continue to be an integral part of the wildlife monitoring program in the Lac de Gras area by providing assistance, local knowledge, and a northern perspective to the program.

Wildlife Baseline Program at the Courageous Lake Study Area

May 2011 to May 2012

MAIN INVESTIGATOR:

Greg Sharam, Wildlife Ecology Discipline Manager, Rescan Environmental Services

WILDLIFE RESEARCH PERMIT NUMBER:

WL006885

LOCATION:

The Courageous Lake project is located south of Courageous Lake at 64° 05'N 111° 15'W; approximately 240 km NE of Yellowknife, NWT.

PARTNERS:

- Members of the Yellowknives Dene First Nation participated in the collection of wildlife data in the role of environmental field assistants.

CONTACTS:

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RATIONALE:

A full baseline study was conducted to collect information on caribou, carnivores (grizzly bears, wolves, wolverine and foxes) and their denning habitats, upland breeding birds, shorebirds, water birds, raptors and wildlife habitat.

OBJECTIVES:

- To characterize baseline conditions and ecology of the area early in the process of any potential development.

METHODS:

Baseline studies focused on mammalian and avian communities and involved both aerial and ground surveys.

RESULTS AND MAIN CONCLUSIONS:

Detailed information regarding the results of the 2011 baseline studies, including maps, will be made available in the Courageous Lake Project: 2011 Wildlife Baseline Report.

LONG-TERM PLANS AND RECOMMENDATIONS:

Habitat for key wildlife species will be mapped using the vegetation and wildlife habitat classification system developed for the Tibbitt to Contwoyto Winter Road.

Photo: GNWT/A. Kasch, ENR

Baseline Wildlife Studies
MMG's Izok Project

March 2012 to December 2012

MAIN INVESTIGATOR:
Charlotte Mougeot, Approvals Manager, Minerals and Metals Group

WILDLIFE RESEARCH PERMIT NUMBER:
WL006891

LOCATION:
The study area is located in the Izok Lake area of the Kitikmeot region of Nunavut and is generally limited to a 30 km buffer surrounding all potential developments associated with the project including the preliminary road alignment from Izok to Lupin.

CONTACTS:
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OBJECTIVES:
- To gather environmental baseline data to support environmental assessment of the Izok project; and
- To provide the information needed to develop a project proposal and environment impact statement for review by the Nunavut Impact Review Board and the Mackenzie Valley Environmental Impact Review Board.

METHODS:
Ungulate surveys will be conducted using systematic aerial surveys. Animals will be counted and recorded both on and off the flight path transect extending 500 m on either side of the aircraft. Sightings of all other wildlife species will be recorded when observed (especially moose and muskoxen), including den locations of grizzly bear, wolf, fox and wolverine.

A wolverine DNA project will be conducted at High Lake encompassing 3,000 km^2 study area centered on the mine, consisting of (120) 5x5 km cells. Two crews will work simultaneously for a one month period to set out one baited 4x4" rough lumber post in the center of each cell, each of which is wrapped with double-stranded barbed wire to trap wolverine hair. The cells will be checked in ten day intervals. Hair samples will be removed, labeled with post number, post side and vertical information. DNA analysis will be conducted on the samples taken.

Grizzly bear DNA inventory was initiated using standard study design. The study will consist of a 12,000 km^2 study area with 10x10 km cell sizes and (4) 10-14 day sessions. Post design will either consist of a single post or a pyramid. Lure will consist of cured blood and fish oil, and trapper scents. Hair handling and DNA analysis will be similar to the wolverine DNA project.

Den site surveys will be conducted within 2-3 km of the proposed road alignment from Izok to Lupin. The study

will be conducted by helicopter flying slowly at low level, in addition to ground-based investigations where appropriate. Hair and/or scat samples may be collected to determine species use of den.

Aerial raptor surveys will be completed in order to document distribution and baseline productivity of raptor species in the study area. The surveys will occur within approximately 10-15 km of the proposed mine infrastructure and road alignment between Izok and Lupin.

RESULTS AND MAIN CONCLUSIONS:

No results and main conclusions submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

No long-term plans and recommendations submitted.

Scientific Study at the Tundra Mine Site

July 2012 to August 2012

MAIN INVESTIGATOR:

Christine Kent, Wildlife Biologist, Rescan Environmental Services

WILDLIFE RESEARCH PERMIT NUMBER:

WL500082

LOCATION:

The Tundra Mine site is a former underground gold mine located approximately 240 km northeast of Yellowknife, NWT. Reclamation activities at the Tundra Mine site were initiated in 2005 and were ongoing through 2012. Some of the activities associated with remedial works have the potential to impact the aquatic environment of two drainage pathways.

In June 2010, Rescan Environmental Services Ltd. was contracted by the Contaminants and Remediation Directorate (CARD), Indian and Northern Affairs Canada (INAC; currently Aboriginal Affairs and Northern Development Canada) to conduct aquatic ecology components of the Tundra Mine construction monitoring program. Wetland bird surveys were conducted in July around the lakes (and associated wetlands) of the main drainage pathway (Pathway I) including Powder Mag, Sandy, Whale Tail and Trans Saddle Lakes.

PARTNERS:

- This work was conducted for the Contaminants and Remediation Directorate (CARD) of Aboriginal Affairs and Northern Development Canada (AANDC), based in Yellowknife, NWT.

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RATIONALE:

The Construction Activity Monitoring Program was designed to monitor for potential effects from the discharge of arsenic treated effluent on aquatic and terrestrial species that utilize and feed in the Pathway I drainage area.

Breeding birds are often chosen for monitoring programs as they represent an abundant and diverse group that is potentially vulnerable to natural and anthropogenic disturbances (Brawn, Robinson and Thompson 2001). In addition, bird monitoring can provide information on prey availability for predator species that rely on breeding birds as a food source.

OBJECTIVES:

- To conduct a survey for waterfowl and shorebird broods at lakes and wetlands downstream of the water discharge route (Pathway 1); and
- To record incidental sightings of wildlife (non-target species) observed at or between survey sites.

METHODS:

One ground-based survey documented water birds and shorebirds found in lakes and ponds along the drainage Pathway I of the Tundra Mine area. The survey was conducted during the breeding season to identify nest sites and brood locations. The survey assessed water bird and shorebird presence and all birds observed were identified to species and recorded. Water bodies within the area were surveyed. At certain water bodies, multiple points were surveyed in order to detect all species present. The number, gender (if possible), and behaviour of each bird was noted. If young were observed, the number of young in a brood and their age was also recorded. Date and GPS location were documented at each survey point. Incidental observations of all wildlife species were also recorded; species name, number, date, and GPS location were noted.

RESULTS AND MAIN CONCLUSIONS:

A total of 67 sites were surveyed for brooding waterfowl and shorebirds on 25 lakes, ponds, rivers, and wetlands along Pathway 1 from July 29 to August 1, 2012. Major lakes surveyed include: Hambone, Powder Mag, Trans Saddle, Sandy, TWB01, TWB02, TWB03, TWB04, and Whale Tail. Both the upper and lower tailings ponds were also surveyed.

Eleven bird species and 97 individual birds were detected within the study area. Of the 11 species, six were water bird and five were shorebird species. Greater scaup, black scoter, and herring gull were the most commonly detected water birds (n=17, 15, and 10). The five shorebird species detected, in order of abundance, were least sandpiper, semipalmated plover, semipalmated sandpiper, pectoral sandpiper, and red-necked phalarope. Five of these species were observed with young: herring gull, greater scaup, least sandpiper, pectoral sandpiper, and semipalmated plover. Sign (feathers) of Canada goose were also observed, but no geese were observed. Upper Tailings Pond and Lower Tailings Pond had the highest individual abundance (n=31 and 30, respectively) and the Lower Tailings Pond also had the greatest species richness (n=6) of all water bodies surveyed within the study area.

An additional 14 species (eight songbirds, one ptarmigan, and five mammals) were also observed (individuals or sign) during the survey and recorded as incidental wildlife sightings.

LONG-TERM PLANS AND RECOMMENDATIONS:

After completion of the water treatment program at the Tundra Mine site, an additional survey may be conducted to monitor for usage of the drainage area by waterfowl (e.g. long-tailed duck and loon) and terrestrial species that have a significant dietary component in the aquatic environment (e.g. red fox).

A status of the environment report program is proposed following site remediation to confirm ongoing health of the environments surrounding the site.

COMMUNITY INVOLVEMENT:

No comments or recommendations from communities were provided prior to this work.

Pine Point Project: Wildlife Baseline Program

June 2011 to May 2012

MAIN INVESTIGATOR:

Greg Sharam, Wildlife Ecology Discipline Manager, Rescan Environmental Services Ltd.

WILDLIFE RESEARCH PERMIT NUMBER:

WL004832

LOCATION:

The proposed Pine Point Project (Project) is owned by Tamerlane Ventures Incorporated and is located in the South Slave Region east of Hay River about 190 km south of Yellowknife, NWT. Wildlife baseline studies were conducted by Rescan in June, July, and September within the Project local study area (LSA) and regional study area (RSA) for the O-556, P-499, X-25, Z-155, and G-03 Deposits and LSA for the N-204 Deposit. Results are broadly presented by either the five deposits area or N-204 area rather than by study area (such as RSA or LSA).

PARTNERS:

- Rescan is conducting environmental baseline studies on behalf of Tamerlane Ventures Inc. to assess the potential effects of the proposed Project in support of a developer's assessment report (DAR).

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RATIONALE:

Baseline studies were conducted to provide a reference point for potential future monitoring studies and allow the evaluation of potential effects of the Project.

OBJECTIVES:

- To collect data on wildlife habitat features and evaluate selected wildlife populations and landscape use within the five deposits LSA and RSA and N-204 LSA.

METHODS:

Baseline studies focused on mammal, amphibian, and avian communities and involved ground surveys. Surveys were conducted to 1) characterize the amphibian community and collect baseline information on focal species' presence, distribution, and breeding habitat quality and/or use, 2) identify land bird species and estimate densities of species in broad habitat types, 3) identify the location(s) of territories of secretive forest breeding raptors, 4) identify water bird species and record distribution and habitat use during breeding and fall staging periods, 5) track wildlife presence through remote digital camera, and 6) conduct habitat assessments for focal wildlife species for habitat mapping studies and record evidence of use in the field.

RESULTS AND MAIN CONCLUSIONS:

Two amphibians, wood frog and boreal chorus frog, were observed during wetland surveys in late June/early July. The two other target species, northern leopard frog and Canadian toad, were not observed; these two species are of conservation concern in the NWT and federally. Both wood frog and boreal chorus frog were breeding in the five deposits area and wood frog was breeding in the N-204 area.

During land bird surveys, 30 species were recorded in the five deposits area and 25 were recorded in the N-204 area. Including all incidental observations in 2011, 61 species were recorded in total within both areas combined. The density of land birds was estimated at 11.7 birds/ha. Trends in habitat use were detected for three species. Yellow-rumped warblers were more abundant in forests than in wetlands, while the reverse was true for swamp sparrow and Lincoln's sparrow. Within the combined five deposits and N-204 areas, eight species of conservation concern were recorded: American tree sparrow, bay-breasted warbler, belted kingfisher, boreal chickadee, common nighthawk, olive-sided flycatcher, rusty blackbird, and white-throated sparrow.

Call playback surveys were conducted for two secretive forest nesting raptors, sharp-shinned hawk and northern goshawk. No responses from focal species were recorded on surveys in either the five deposits area or N-204 area; however, sharp-shinned hawks were recorded incidentally in the N-204 area in June and September, confirming that they are present during the breeding season. An additional ten raptor species were recorded incidentally within both areas combined. Two red-tailed hawk nests were observed in the five deposits (one confirmed to be active, the other potentially active), and three unknown raptor nests were recorded in the N-204 area. One of the eleven raptor species observed is of conservation concern, peregrine falcon. Two falcons were observed in the five deposits area in September. This species is a cliff nesting species and breeds north of the Project; therefore, its presence is only expected during migration periods (i.e. spring and fall).

Water bird surveys were conducted during the breeding season and fall staging period. Seventeen species were recorded during wetland surveys or incidentally in the five deposits area and 20 species were recorded in and near the N-204 area; within both study areas combined, 24 species were recorded. More species were recorded during the breeding period as opposed to the fall staging period in the five deposits area, while the reverse was true in the N-204 area. However, the abundance of individual water birds was higher during the fall in both areas. Seven species were confirmed to be breeding in the two study areas; Bonaparte's gull, bufflehead, common loon, killdeer, lesser sandhill crane, lesser yellowlegs, and solitary sandpiper. Four species observed are of conservation concern: horned grebe, lesser scaup, least sandpiper, and lesser yellowlegs. In addition, call playback surveys were conducted for yellow rail, whooping crane, and horned grebe in five deposits and N-204 areas in June. No target species responses were recorded during surveys; however, horned grebes were detected incidentally, confirming their presence in the area.

Remote digital cameras were active for 86 days in the five deposits area and for 88 days in the N-204 area. During this time, photographs of black bear, sandhill crane, pileated woodpecker, and woodland caribou were recorded. The majority of photographs of wildlife were triggered by wildlife passing by the camera; only one photograph (pileated woodpecker) was taken during a pre-programmed timed event.

Habitat assessments were conducted to assess the presence and habitat use for nine focal species, including black bear, moose, white-tailed deer, woodland caribou, wood bison, American marten, fisher, beaver, and muskrat. Evidence of use was confirmed by four focal species in the five deposits area and seven focal species in the N-204 area in the fall.

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife baseline studies are planned for 2012 to build on studies conducted in 2011 for the Project. The 2012 field season will include studies on ungulates, carnivores, furbearers, raptors, water birds, amphibians, and bats. Habitat for key wildlife species will be mapped using the vegetation and wildlife habitat classification system developed by the British Columbia Resource and Information Standards Committee.

COMMUNITY INVOLVEMENT:

Tamerlane will be organizing community meetings before the end of June 2012 to present the results of environmental studies conducted in 2011 and to present the proposed study plan for 2012. Meetings will be held in Fort Resolution, Hay River, and on the K'átł'odeeche First Nation Reserve.

Representatives of the Hay River Métis Government Council, the Fort Resolution Métis Council, and the Deninu Kué First Nation participated in the collection of wildlife data during the summer of 2011 in the role of environmental field assistants. Rescan will hire local field assistants during the 2012 field season.

Remote camera photo of black bear rubbing its back against a tree.

Photo: Rescan

Photo: GNW

Plan to Mitigate and Monitor the Impacts of Oil and Gas on Beaufort Sea Polar Bears

Initiated Fall 2012

MAIN INVESTIGATOR:

Marsha Branigan, Manager Wildlife Management, Environment and Natural Resources, GNWT, Inuvik Region

LOCATION:

Inuvialuit Settlement Region, NWT.

PARTNERS:

- Hunters and Trappers Committees (HTCs)
- Environment Canada
- IMG Golder (contractor)
- Wildlife Management Advisory Council (NWT)
- Inuvialuit Game Council

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RATIONALE:

This project was a direct response to the Mackenzie Gas Project Joint Review Panel recommendations 10.13 and 10.14, which concerned the impact of oil and gas activities on polar bears in the Beaufort Sea. The Governments of Canada and the Northwest Territories are working together to address these recommendations.

OBJECTIVES:

To develop a plan to mitigate and monitor the impacts of Oil and Gas activities on polar bears in the Beaufort Sea in collaboration with the communities of the Inuvialuit Settlement Area and other partners.

METHODS AND INFORMATION COLLECTED:

A contractor was hired to conduct a literature review on the impact of oil and gas activities on polar bears and draft a plan to mitigate and monitor those impacts. The contractor also held community meetings in Aklavik, Inuvik, Paulatuk, Sachs Harbour, Tuktoyaktuk and Ulukhaktok to explain the project and collect advice and comments to be incorporated into the literature and draft plan.

RESULTS AND DELIVERABLES:

Meetings were held in each community. Notes were provided from each meeting. A literature review and draft plan was provided to Environment and Natural Resources (ENR).

LONG-TERM PLANS AND RECOMMENDATIONS:

The draft plan needs to be reviewed with communities, co-management partners, Environment Canada and other interested parties including industry. ENR will revise and finalize the plan based on comments received. Recommendations from the plan will be used to mitigate

and monitor the impacts of oil and gas activities on polar bears in the Beaufort Sea.

COMMUNITY INVOLVEMENT:

Comments or recommendations from communities were incorporated into the draft plan. The community HTCs will need to review and update the plan.

Community Based Monitoring in the Sahtu Region

January 2013 to March 2013

MAIN INVESTIGATOR:

Jean Polfus, Ph.D. Candidate, University of Manitoba

LOCATION:

Sahtu Settlement Area

PARTNERS:

- Sahtu Renewable Resources Board
- University of Manitoba
- Environment and Natural Resources
- University of Calgary
- Trent University
- Renewable Resources Councils of Fort Good Hope, Tulita, Dél̨ı̨nę, and Norman Wells
- Explor
- ConocoPhillips
- Husky

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RATIONALE:

This collaborative caribou and moose research program was developed by the Sahtu Renewable Resources Board, the five Sahtu Renewable Resources Councils (RRCs), Environment and Natural Resources (ENR) Sahtu Region, the University of Manitoba and the University of Calgary. The RRCs want to see noninvasive techniques used to 1) monitor the health of local caribou and moose populations and 2) get a better understanding of their population dynamics and range boundaries.

OBJECTIVES:

- To build partnerships with the local Renewable Resources Councils;
- To develop research questions and identify shared objectives; and
- To work with hunters and trappers to collect samples from harvested animals as well as fecal pellets from feeding and bedding areas for genetic analysis.

METHODS AND INFORMATION COLLECTED:

In January 2013 a series of RRC and public meetings were held to set up a solid plan for winter sampling, build awareness for the program, and train community members in sampling techniques. These meetings were held in collaboration with Dr. Susan Kutz (University of Calgary) to coordinate the collection of both genetic and health monitoring samples. Public meetings were held in Fort Good Hope (January 25), Norman Wells (January 26), Tulita (January 28) and Dél̨ı̨nę (January 29). Full day RRC meetings were held in Fort Good Hope, Tulita, and Dél̨ı̨nę.

Community members were asked to bring completed sample kits to their local RRC office or to the Norman Wells ENR office where they received a $25 gift

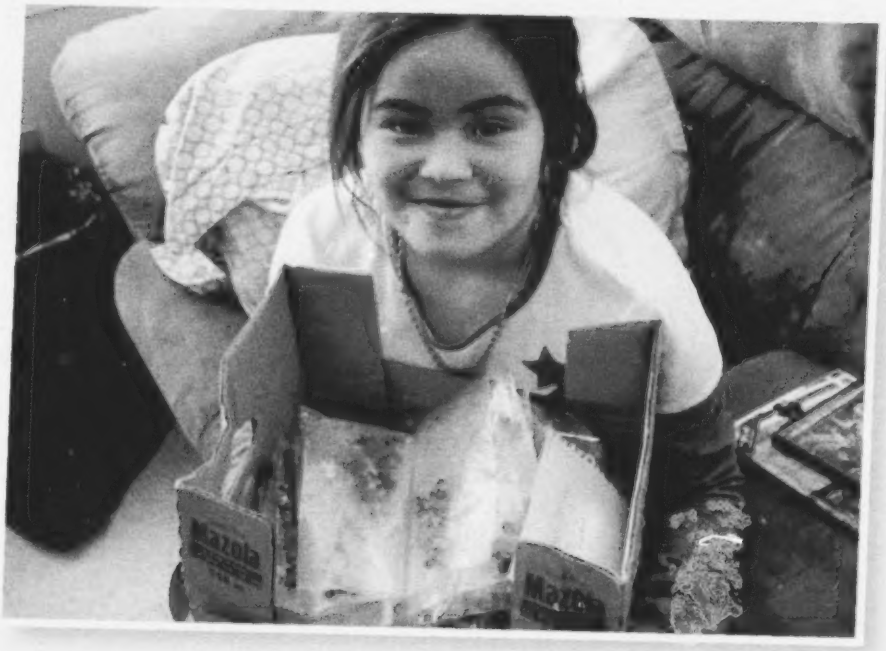

Photo: J. Polfus

Community member with caribou fecal sample collection.

certificate for gas. The RRC and Norman Wells ENR office were provided with sample kits to pass out to anyone interested in getting samples. The RRCs are fully involved in the project and oversaw sample collection and data entry, and supervised gift card distribution.

During the winter, Jean Polfus traveled within the communities in the Sahtu to provide support for the RRCs, collect samples, participate in harvesting activities, meet with students at Aurora College in Déline, and coordinate the sampling effort.

Jean Polfus and Richard Popko also held a meeting with the community of Colville Lake in March to discuss the current research initiatives and invite community participation.

As part of the larger project (funded by other sources), Jean Polfus and the SRRB held focus group meetings in each of the Sahtu communities in April 2013. The focus groups discussed the outcomes of the sampling effort during the winter and ways to improve the research, planned for the next winter, and shared knowledge about caribou populations in the Sahtu. These meetings were administered by the RRCs in each community.

RESULTS AND DELIVERABLES:

We collected 99 woodland caribou fecal samples, 34 barren-ground caribou fecal samples, 3 barren-ground caribou tissue samples, 17 moose tissue samples, 69 moose scat samples and 4 mountain caribou tissue samples as part of the project in collaboration with local

hunters, trappers, industry partners and ENR biologists over only 3.5 months during the winter of 2013. These samples, when combined with the samples available from the Parks Canada repository (Keri McFarlane) and from regional offices in the NWT, contribute to a growing dataset of caribou genetic information. The 2013 fecal pellet samples are being analyzed during the summer of 2013 and we expect to have preliminary results by early fall of 2013.

In year two of the study (winter 2013-2014), it will be possible to contribute to the phylogenetic study and to complete a genetic population analysis for the region by addressing many of the spatial gaps in sampling from the pilot year. In order to do this, we will run targeted sampling efforts in combination with the ongoing hunter-based sample collection. The targeted sampling will involve collaboration with ENR projects already in place to maximize the efficiency of travel to remote locations.

Products resulting from research project include:

- Technical and plain language reports on sampling methods and results of sample collection, knowledge sharing, and genetic results.
- Protocols for the collection of fecal pellet samples in collaboration and coordination with local harvesters, trappers, and land users.
- A series of peer reviewed journal articles on: genetic results, collaborative and cross-cultural research methodologies, intersections between harvester knowledge and genetic results, and management outcomes.
- Maps of spatial relationships and levels of genetic connectivity between caribou populations in the study area.
- Project website including digital maps.

LONG-TERM PLANS AND RECOMMENDATIONS:

Understanding how caribou populations are spatially structured on the landscape is a question of interest to managers, ecologists, and Aboriginal harvesters. Determining the spatial extent of population boundaries is an important first step required for subsequent genetic population size and trend analysis (however, the scope of this project does not include genetic capture-mark-recapture methods needed to analyze population demographics). The purpose of this research is to develop a comprehensive understanding of the identities and relationships among caribou populations and Aboriginal people in the Sahtu region to inform and prioritize management efforts.

The project has two broad objectives:

Caribou Biodiversity: to identify and map the main evolutionary caribou lineages and apply genomic analysis to assess the basis for differentiation and adaptation at the subspecies and ecotype levels.

Spatial Organization of Caribou: to conduct population genetic analysis to describe the spatial organization of boreal caribou at the ecotype and population levels, identify core range areas and demographic and genetic connectivity among those areas.

This study is intended to generate increased levels of communication between academic researchers, government biologists, co-management boards, Aboriginal people, and the public. Ideally, the foundations of this research will help to provide a framework for respectful communication that can be applied to other species of important cultural value to local people. The research will also help to understand the complexity inherent in maintaining ecological integrity and biodiversity in the Sahtu Region.

COMMUNITY INVOLVEMENT:

The main objective of the proposed research is to support the initiatives proposed by communities in the Sahtu Region through the development of a robust research program that incorporates multiple sources of knowledge into a detailed understanding of caribou variation.

In December 2012, Jean Polfus and Deborah Simmons (SRRB) met with the RRCs in Norman Wells (December 1), Fort Good Hope (December 5-6), Tulita (December 10-13), and Dél̨ı̨nę (December 16-17) to discuss the project and plan for the pilot season of winter field work. These discussions facilitated the development of research priorities, research questions, and appropriate methods for the current and future monitoring of caribou populations. Researchers will continue to work with the RRCs to develop the program and interpret the results. Research will coordinate with and complement other ongoing regional projects in health and biodiversity monitoring. A project website has been developed to engage the community in the research: http://nricaribou.cc.umanitoba.ca/sahturesearch.

Central Mackenzie Valley Monitoring Project

June 2012

MAIN INVESTIGATOR:

Richard Popko, Manager Wildlife Research and Monitoring, Environment and Natural Resources, Sahtu Region

LOCATION:

The Renewable Resources Council workshop was held in Tulita from June 18-20, 2012.

PARTNERS:

- Sahtu Renewable Resources Board
- Tulita Renewable Resources Council

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RATIONALE:

In 2011 five companies submitted winning bids (totaling $534,192,015) for eleven oil and gas land parcels in the Tulita District of the Sahtu Settlement Area. One of these companies began operations over the winter of 2011/12. In addition to this, Explor Geophysical Ltd. started seismic operations which span across all 11 parcels. This level of proposed development is unprecedented in the Sahtu region. Renewable Resources Councils (RRCs) from all five Sahtu communities were invited to participate in the June 2012 workshop in order to determine research and monitoring priorities for the area in and around the area of proposed oil and gas activity.

OBJECTIVES:

The purpose of the workshop will be to ensure that the Sahtu region's RRCs have a strong voice in decisions related to two priority issues:

- The current development boom in the region and the research needed to prepare for it, protecting wildlife and wildlife habitat; and
- The federal government's draft *Boreal Caribou Recovery Strategy*.

METHODS AND INFORMATION COLLECTED:

Environment and Natural Resources (ENR) asked the Sahtu Renewable Resources Board (SRRB) and the Tulita Renewable Resources Council (TRRC) to host and help organize the workshop.

Expenses for three delegates from each Renewable Resources Council (RRC) were provided; the workshop was open to the public and advertised locally.

On the first day of the workshop there was discussion on the amount of development and the regulatory processes through which RRCs have input on this development (Sahtu Land and Water Board, Sahtu Land Use Plan). People spoke about the need for both western

science and traditional knowledge in order to minimize impacts of industry on the land.

During the second day of the workshop attendees spoke about the importance of getting baseline data through monitoring. People spoke about the importance of all animals (from moose to mosquitoes) and the need for protected habitat. There was willingness from the RRCs to work together and with ENR to try and get some sort of consistency when dealing with industry. The knowledge of the Sahtu elders and the need for their inclusion in any future work as well as the importance of bringing traditional knowledge and western science together was highlighted.

RESULTS AND DELIVERABLES:

The workshop was recorded and transcripts are kept on file. Building on the success of this workshop the SRRB held an RRC gathering prior to the September 2012 board meeting. At this gathering Dr. Micheline Manseau, of the University of Manitoba, spoke about her work using non-invasive techniques to monitor animal populations. This gathering helped to establish the Community Based Monitoring project with Dr. Manseau's student Jean Polfus.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long term plans are to continue to get community direction and public support for all research and monitoring projects.

COMMUNITY INVOLVEMENT:

The purpose of the workshop was to hear what the Sahtu Renewable Resources Councils felt were the priorities for future monitoring in the Central Mackenzie Valley.

Photo: GNWT/J. Nagy, ENR

Boreal woodland caribou

Seasonal Range Use and Movement Patterns of Boreal Caribou in the Dehcho

April 2012 to March 2013

MAIN INVESTIGATOR:

Nic Larter, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, Dehcho Region

LOCATION:

The *ca.* 80,000 km^2 study area includes both the south central and north central portions of the Dehcho, roughly bounded to the north by Blackwater Lake, to the south by the 60th parallel, to the east by the Redknife Hills (south) and the Horn Plateau (north), and to the west by the Liard Highway 7 (south) and the Mackenzie River (north). Collared boreal caribou have and will likely continue to move back and forth across the NWT-British Columbia and NWT-Alberta borders and expand the current boundary as described.

PARTNERS:

- Environment and Natural Resources
- Sambaa K'e Dene Band (Trout Lake)
- Jean Marie River First Nation
- Liidlii Kue First Nation (Fort Simpson)
- Fort Simpson Métis Local
- Nahanni Butte Dene Band
- Pehdzeh Ki First Nation (Wrigley)
- Acho Dene Koe Band (Fort Liard)
- Ka'a'gee Tu First Nation (Kakisa)

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RATIONALE:

Boreal caribou are listed as Threatened in Canada under the federal *Species at Risk Act*. Shorter-term studies on the basic ecology of boreal caribou have been conducted in other parts of their range in the NWT (Inuvik, Sahtu, and South Slave). Because of the likelihood of increased resource development throughout their range, there is a need to collect as much information over as wide an area of boreal caribou range as possible prior to large-scale resource development. Local First Nations saw the benefits of combining their own traditional knowledge with information gathered from collared caribou and collars have been deployed on caribou in their traditional areas at their request since 2004. This study has the longest time series of demographic data for boreal caribou in the NWT, based upon collared caribou, and has the continued support of its First Nation partners.

OBJECTIVES:

- To document and monitor annual calf production, calf survival, and adult survival in order to make annual estimates of λ, by maintaining a minimum of 30 collars on females in the population;
- To ensure that the distribution of collared boreal caribou covers key areas throughout the range of boreal caribou in the Dehcho region;
- To provide empirical data to determine areas of secure boreal caribou habitat, given the current human footprint and natural disturbance, and for RSF modeling to assist with assessing important habitat types/areas;
- To use daily movement data from female boreal caribou collected over multiple years to determine the period of calving, whether or not females show fidelity to calving areas, and individual calving traits for female caribou in the Dehcho study area;
- To provide current knowledge of boreal caribou research/ecology to the Dehcho Boreal Caribou

Boreal caribou observed in the Dehcho region.

Photo: GNWT/D. Allaire, ENR

Working Group and for use in evaluating regional land use applications;

- To provide empirical data and current knowledge for use in the development of range management plans for boreal caribou as part of the National Recovery Strategy;
- As development occurs to be able to assess responses of female caribou in relation to their use of space in the landscape;
- To continue screening for disease and parasites from blood and fecal samples and to collect fecal samples to assess alternate methods for estimating population parameters, assess genetic diversity in boreal caribou and investigate subpopulation units, as part of a larger collaborative project with studies in other regions of the NWT; and
- To provide baseline information on caribou ecology in the Arrowhead area prior to additional industrial exploration and activity and for a seismic line regeneration study being initiated in the area.

METHODS AND INFORMATION COLLECTED:

In February 2013, collars were deployed on ten female caribou throughout the Dehcho and where requested by our First Nation partners.

- Blood samples were tested for serum progesterone, cortisol and a biochemistry panel.
- Fecal samples were analyzed for a various diseases and parasites.
- Daily satellite collar location data were received, entered into a database, and analyzed as required.

- Four collars were retrieved and those that could be refurbished were in time for the February 2013 deployment.
- Calving events were determined for all collared females based upon daily movement patterns during May and June (2004-2012).
- A March 2013 survey was conducted to document the number of collared females still with calves of the year and to classify all caribou observed into different sex/age groups.

RESULTS AND DELIVERABLES:

- Posters showing individual caribou ranges over a three-month period were produced quarterly and distributed to our First Nation partners on an ongoing basis.
- Survey results and a summary of the collar deployment were circulated to all First Nations partners on a timely basis.
- A presentation on the program was made at the 6th Dehcho Biennial Regional Wildlife Workshop. First Nation delegates critiqued and provided comment and direction for the program over the next two years.
- A presentation on the results of the calving analysis was made at the 14th North American Caribou Workshop.
- The Dehcho Boreal Caribou Study progress report (April 2013) will be circulated to all partners and posted on the ENR website.
- Data from this study was provided to the Dehcho Boreal Caribou Working Group as and when requested.
- Location data from this study was incorporated into two scientific manuscripts that have been submitted for publication.

LONG-TERM PLANS AND RECOMMENDATIONS:

- This is a long-term ongoing program to monitor population demographics of boreal caribou in the Dehcho which requires the use of collars and has the support of eight Dehcho First Nation partners.
- Continue annual deployment of enough collars to maintain a minimum of 30 active collars during the calving period.
- Continue determining annual calving events and conducting annual March surveys to determine overwinter survival of calves.
- Continued analysis of location data to refine areas of secure habitat and to assist with assessing regeneration of disturbed areas.
- Continue providing information to the Dehcho Boreal Caribou Working Group and for use in formulating range management plans, cooperative research programs, and evaluating land use permitting applications.

COMMUNITY INVOLVEMENT:

At annual community meetings and biennial regional wildlife workshops the caribou program is discussed in an open forum format. Community issues and concerns are addressed and collar deployment takes direction from these meetings. An annual application for wildlife research permitting provides additional avenues for community input. Local residents have participated in collar retrievals and in aerial reconnaissance flights when and if recommended by local First Nations. Because we all want to minimize animal harassment collar deployment is contracted out to a professional team which had the full support of delegates at the most recent Regional Wildlife Workshop. Community members sit on the Dehcho Boreal Caribou Working Group. As part of its mandate the group not only solicits information from this study but also provides recommendations for this study which include caribou capture and the deployment of collars.

Photo: GNWT/N. Lanter ENR

Caribou bedding sites observed in the snow.

Mountain Goat Population Status in Southern Mackenzie Mountains

April 2012 to March 2013

MAIN INVESTIGATOR:

Nic Larter, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, Dehcho Region

LOCATION:

The study area is the southern Mackenzie Mountains south of 63° N latitude, specifically in zones D/OT/01, D/OT/02, and S/OT/03.

PARTNERS:

- Environment and Natural Resources
- The Association of Mackenzie Mountain Outfitters, in particular Nahanni Butte Outfitters, South Nahanni Outfitters, and Ram Head Outfitters.

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RATIONALE:

Information on the status of mountain goats in the Mackenzie Mountains is extremely outdated. There has been an increase in the annual mountain goats harvest since 2005. Recent survey information indicates that the number of mountain goats in the Mackenzie Mountains is greater than that reported in the 2000 status report but it behooves ENR to ensure there is appropriate baseline mountain goat population data with which to evaluate current harvest levels. Recently it was reported that moose from the Mackenzie Mountains had high levels cadmium resulting in a public health advisory for the consumption of moose organs. Moose, northern mountain caribou, mountain goat, and Dall's sheep are all harvested from southern Mackenzie Mountains and their meat and organs are consumed. Therefore, there is a need to determine whether elevated levels in cadmium and other heavy metals also occurs in the other sympatric ungulates of the area.

OBJECTIVES:

- To work cooperatively with members of the Association of Mackenzie Mountain Outfitters to collect information on the current number and distribution of mountain goats in the southern Mackenzie Mountains;
- To collect harvest information from mountain goats harvested annually in the southern Mackenzie Mountains;
- To monitor the non-resident and non-resident alien harvest of mountain goats; and
- To assess the levels of various heavy metals, radionuclides and stable isotopes in different tissues of mountain goats.

METHODS AND INFORMATION COLLECTED:

We continued to collect observations, harvest information, and DNA samples from mountain goats

harvested in the Mackenzie Mountains during the 2012 hunting season. Outfitters provided us with tissue samples from mountain goats. These included tongue, kidney, and muscle. Samples were forwarded to different labs for a variety of analysis including the presence of 33 different heavy metals, various radionuclides, and stable isotope levels. Tongue samples were banked for analysis the following year.

RESULTS AND DELIVERABLES:

Harvest information from 2011 was published in the annual harvest summary, Manuscript Report No. 220: www.enr.gov.nt.ca/_live/documents/content/220_manuscript.pdf.

Some of the preliminary results on the analysis of heavy metals and radionuclides in the tissues of mountain goat were presented at the 7th International Moose Symposium. A scientific manuscript on more detailed analyses is being prepared for submission. We are awaiting the lab results from the year two samples.

LONG-TERM PLANS AND RECOMMENDATIONS:

- To compile all survey and observation data along with harvest data and the results of the tissue analysis for various heavy metals, radionuclides and stable isotopes to produce an up-to-date all-encompassing status report on mountain goat in the Northwest Territories.
- To make a presentation on the current status of mountain goats in the Northwest Territories at the 2014 Northern Wild Sheep and Goat Council Symposium.
- To produce scientific manuscripts on the comprehensive results of the multi-year tissue analysis.
- To continue to collect sex, age, and DNA samples from all goats harvested in the Mackenzie Mountains and publish this information in the annual Mackenzie Mountains harvest report.
- To have all analyses completed in time for the assessment of mountain goat by the NWT Species at Risk Committee.
- To continue to work collaboratively with Yukon biologists to better assess the transboundary status of mountain goats.

COMMUNITY INVOLVEMENT:

Because of their remoteness to communities, there is virtually no community interest in mountain goats, and therefore little community involvement.

Photo: GNWT/N. Larter, ENR

Southern Mackenzie Mountain range surveyed for mountain goats.

Dehcho Biennial Regional Wildlife Workshop

April 2012 to March 2013

MAIN INVESTIGATOR:

Nic Larter, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, Dehcho Region

LOCATION:

Delegates from all Dehcho First Nations travel to Fort Simpson for a two day workshop.

PARTNERS:

- Environment and Natural Resources (Dehcho and Headquarters)
- Parks Canada
- University of Calgary
- Dehcho First Nations
- Thomas Simpson School

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RATIONALE:

Shortly after staffing the Environment and Natural Resources (ENR) biological program in spring 2002, Dehcho First Nations and the then Department of Resources, Wildlife and Economic Development co-hosted a regional wildlife workshop in order to discuss local wildlife issues, introduce the newly hired biological staff, and get direction for pertinent regional wildlife research programs. The workshop was such a success that one of the resulting action items was for RWED to ensure that similar workshops be held every two years. Subsequently, workshops have been held in 2004, 2006, 2008, 2010, and 2012 with a request for another workshop in 2014.

OBJECTIVES:

- To facilitate the ongoing communication between wildlife researchers and Dehcho First Nations membership;
- To provide an open forum for the discussion of wildlife issues of concern to Dehcho First Nations members;
- To provide an open forum for wildlife researchers, from a variety of organizations, to present results of their work and receive feedback; and
- To provide an open forum for the discussion and direction of proposed wildlife research in the Dehcho.

METHODS AND INFORMATION COLLECTED:

ENR covers all expenses for up to two delegates from each Dehcho First Nation to attend the workshop. The workshop is open to the public and often many First Nation members in addition to the delegates attend. The workshop covers two days with presentations and discussions. Coffee breaks and catered lunches (by local schools) on site make for a relaxed atmosphere which also facilitates the viewing of many posters and

continued less formal discussions amongst attendees. The first day consists mostly of presentations of proposed and ongoing wildlife research programs in the region by various government and non-government organizations. Day one always begins with a presentation critiquing how well ENR has responded over the past two years to the action items tabled at the previous workshop. The second day is mostly open discussion revolving around First Nation concerns, comments and criticisms of wildlife issues and wildlife programs. The day and workshop ends with a consensus on a list of action items for ENR to address over the next two years before the next workshop.

RESULTS AND DELIVERABLES:

A final report is generated after each workshop. The report includes a summary of all discussion topics, a list of the action items, a list of all in attendance, and copies of all the presentations made. A hard copy is circulated to all Dehcho First Nations and participating organizations. A digital copy of the report is also posted on the ENR website. Digital transcripts of the workshop are kept on file. Copies of posters are available on request. Copies of reports and scientific papers pertinent to presentations are made available at the workshop.

LONG-TERM PLANS AND RECOMMENDATIONS:

It is recommended that these workshops continue being held every two years. The format has been so successful that workshops in other regions have followed this format. We need to continue to promote the exceptional attendance of all Dehcho First Nations at this workshop.

COMMUNITY INVOLVEMENT:

This biennial workshop is a key forum for all Dehcho First Nations to comment, critique, and make recommendations on all Dehcho ENR wildlife programs. It is well attended by members of all Dehcho First Nations and the community. Delegates at the workshop generate action items which are implemented into the appropriate programs and critiqued as part of the agenda for the next meeting. Local schools participate as caterers for the event.

Photo: GNWT/N. Larter, ENR

Community member looking at a map of where collars were deployed on boreal caribou.

Community members listening to Nic Larter giving a presentation.

Photo: GNWT/D. Allaire, ENR.

Dehcho Boreal Caribou Working Group

April 2012 to March 2013

MAIN INVESTIGATOR:

Nic Larter, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, Dehcho Region

LOCATION:

The core area of interest for the group is bounded by the range of boreal caribou to the west, the NWT border to the south, the Dehcho border to the north and the Hay River to Great Slave Lake, west following the Mackenzie River to 118°W and north to the Dehcho border as the eastern boundary.

PARTNERS:

- Environment and Natural Resources
- Sambaa K'e Dene Band (Trout Lake)
- Ka'a'gee Tu First Nation (Kakisa)
- Jean Marie River First Nation
- Nahanni Butte Dene Band
- Dehcho First Nations

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RATIONALE:

Boreal caribou is a culturally important wildlife species in the Dehcho and elsewhere in the Northwest Territories. They are listed as Threatened in Canada under the federal *Species at Risk Act*. There has been ongoing interest in forming a group to ensure that boreal caribou and their habitat are conserved for current and future generations in the Dehcho region. This group was established in February 2011.

OBJECTIVES:

- To conserve boreal caribou and their habitat in the Dehcho region;
- To provide a forum for information exchange and ensure the most current information is disseminated to all stakeholders;
- To provide direction and advice to the Dehcho leadership, Dehcho communities, Dehcho Land Use Planning Committee, the Government of the Northwest Territories, and the Government of Canada on the conservation of boreal caribou and their habitat in the Dehcho region;
- To assist in the development of a management plan and range management plan for boreal caribou in the Dehcho region. Developing these plans will include discussion of cumulative effects, climate change, natural disturbance (like fire), anthropogenic disturbance, land use planning, mitigation and habitat reclamation planning, and research monitoring and management activities; and
- To review and make recommendations on data requests pertaining to collared boreal caribou in the core area of interest.

METHODS AND INFORMATION COLLECTED:

The working group had two face-to-face meetings; one in Fort Simpson in May and a second in Checkpoint in

January. The working group had two teleconferences; one in October and one in November. At the face-to-face meetings presentations were made by Environment and Natural Resources Wildlife and Forest Management divisions on current and upcoming research programs. The working group reviewed a number of traditional knowledge reports and the draft report on the *Species Status Report for Boreal Caribou (Rangifer tarandus caribou) in the Northwest Territories.*

RESULTS AND DELIVERABLES:

- The first edition of a Dehcho Boreal Caribou Working Group newsletter was published and circulated.
- Comments were provided on reports and presentations of research programs.
- Recommendations were made on areas to protect from forest fires for the 2013 fire season.
- A logo was chosen for the working group.

LONG-TERM PLANS AND RECOMMENDATIONS:

As part of its mandate, the Dehcho Boreal Caribou Working Group will assist with the development of range management plans. Therefore, it is anticipated that the working group will have a long-term presence in the Dehcho.

COMMUNITY INVOLVEMENT:

Five of the six members of the working group are from different communities in the Dehcho. There are at least two face-to-face meetings held annually. One is in Fort Simpson and the other is held in one of the four outlying communities. Open houses for additional local involvement are held in conjunction with face-to-face meetings.

Photo: W. McKay

Dehcho Boreal Caribou Working Group members.

DEHCHO
BOREAL CARIBOU
WORKING GROUP

Photo: GNWT/N. Lanter, ENR

Face to face meeting of the Dehcho Boreal Caribou Working Group.

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